MARCH, 1912. Vol. LVI. No. 409.

JOURNAL

OF THE

Royal United Service Institution.

Registered for Transmission to Canada by Canadian Magazine Post.

PUBLISHED UNDER THE AUTHORITY OF THE COUNCIL.

All communications (except those for perusal by the Editor only) to be addressed to the Secretary, Royal United Service Institution.

LONDON :

The Royal United Service Institution,
WHITEHALL, S.W.

Telegraphic Address : "RUSSATUS, LONDON."

Printed by J. J. KELIHER & CO., LIMITED, 33, King William Street, E.C.,
And Craven House, Kingsway, W.C.

Sole Advertisement Contractor: Mr. C. GILBERT-WOOD, Norfolk House, Victoria Embankment, London, W.C.
Telegraphic Address: "GILBERWOOD, LONDON."

All rights reserved.

Price Two Shillings.

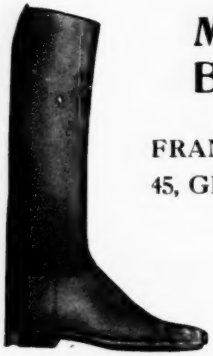
Only those who have tried it
know the refreshing effect of a

Mustard Bath

A hot bath to which is added a couple of tablespoonfuls or so of COLMAN'S MUSTARD.

S H.B. 7380

Craig & Davies



Military and Civil BOOTMAKERS,

FRANCIS STREET, WOOLWICH.
45, GLASSHOUSE ST., REGENT ST., W.
40, High Street, Aldershot;
and York Town, Camberley.

ESTABLISHED 1824.

SPECIALITY:

BUTCHER FIELD BOOTS.

Bootmakers by Appointment to Royal Military Academy.

F. C. BAYLEY

Hosier, Shirtmaker & Glover,

WHITE SHIRTS
7/6, 8/6 each
WOOLLEN SHIRTS
8/6, 10/6, 12/6 each
LINEN SHIRTS
15/6, 18/6 each

34 STRAND,
19 GREEN STREET, LEICESTER SQUARE
& 8 PICCADILLY ARCADE.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT WOOD'S OFFICES, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.
TELEPHONE No. 4680 GERRARD.

LIPTONS

The Largest Tea and Provision Dealers in the World.

MANAGEMENT OF CANTEENS A SPECIALITY.

TERMS, PRICES, REBATES, &c., ON APPLICATION

ALDERSHOT—Elms Road.
PORTSEA—35, Queen Street.
DEVONPORT—Holman's Buildings.
DUBLIN—23, Merchant's Quay.
GIBRALTAR—Grand Hotel Buildings.
MALTA—39, Strada Reale, Valletta.
ALEXANDRIA—Rue Adib.
CAIRO—9, Rue Osselli.
CALCUTTA—32/1, Dalhousie Square.
COLOMBO—Prince Street.
BOMBAY—Apollo Street.
KARACHI—Nicoll Road.

Head Offices—CITY ROAD, LONDON.

CONTENTS FOR MARCH, 1912.

1.	ROYAL MILITARY COLLEGE, DUNTROON, AUSTRALIA	*Frontispiece*
2.	SECRETARY'S NOTES	295
3.	PRINCIPAL ADDITIONS TO LIBRARY	299
4.	THE DEVELOPMENT OF OUR SYSTEM OF NATIONAL LAND DEFENCE. BY COLONEL S. A. E. HICKSON, D.S.O.	301
5.	EVENTS OF THE YEAR 1911 IN FOREIGN ARMIES	323
6.	INFANTRY IN BATTLE. BY LIEUT.-COL. J. CAMPBELL, D.S.O.,	349
7.	THE POSITION OF THE TORPEDO IN 1911. FROM *Nauticus* ...	368
8.	THE DEVELOPMENT OF UNDER-WATER PROTECTION. FROM *Nauticus*	390
9.	THE REVOLUTION IN CHINA (UP TO THE END OF FEBRUARY, 1912)	406
10.	THE WAR IN THE MEDITERRANEAN	410
11.	SPANISH OPERATIONS IN THE RIFF...	417
12.	NAVAL AND MILITARY CALENDAR	420
13.	NAVAL NOTES. *British Empire. Home* : Health of the Navy ; Loss of the "A 3." *France:* First Cruiser Squadron ; Trials of "Waldeck Rousseau" ; Port of Biserta. *Italy:* New Ships ; Contract for Armour ; Naval Budget ; Constitution of the Fleet. *United States:* Escape of the "Warrington" ; Flight of projectiles.	421
14.	MILITARY NOTES. *British Empire. Home:* Rifles and Ammunition ; Estimates for 1912-13. *Australia:* Railway Council ; Royal Military College. *India:* Abor Expedition. *Austria-Hungary:* Honved Budget. *Belgium:* War Minister Resigns ; Belgian Congo. *Bulgaria:* Military Council. *France:* Artillery ; Colonies. *Germany:* Equipment ; Transport ; Training ; Fortifications. *Holland:* Army ; Colonies. *Japan:* Cavalry Training ; Manœuvres. *Montenegro:* Frontier. *Norway:* Military Budget ; Mountain Artillery. *Ottoman Empire:* Yemen ; Mesopotamia ; Army. *Persia:* Ex-Shah ; Bushire-Shiraz road. *Portugal:* Army ; Colonies. *Rumania:* Army. *Russia* ; Death of General Milyutin. *Switzerland:* Communications ; Army. *United States* : Suspension of Adjutant-General. *Other American States*	432
15.	AERONAUTICAL NOTES.	461
16.	NOTICES OF BOOKS	468
17.	CONTENTS OF FOREIGN PERIODICALS	475

THE

H.V. Velvet Grip

GENTLEMEN'S PATENT

BOSTON GARTER.

COTTON, 1/- pair.

SILK, 2/- pair.

By Post, 1d. extra.

The only "GRIP" that "GRIPS" securely without injury to the Hose.

GEORGE HODGKINSON & Co.

Hosiers, 1, Station Buildings, Broadway, WESTMINSTER, S.W.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT-WOOD'S OFFICES, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.
TELEPHONE No. 4680 GERRARD.

The "Bisley Set" in use.

TELEPHONES.
STRONG
RELIABLE
PORTABLE
MAGNETO or
BATTERY CALL.

For Rifle Ranges or Private Estates.
Complete Installations carried out.

GRAHAM & LATHAM, Ltd., 104 Victoria St. London, S.W.

EXPLOSIVES of Every Description

For
BLASTING,
SPORTING
and
MILITARY
PURPOSES.

TRADE MARK
CURTIS'S & HARVEY, Ltd. LONDON.
DRAGON BRAND.

BEST QUALITY ONLY.

CONTRACTORS
to
H.M., COLONIAL
and
FOREIGN
GOVERNMENTS.

ONLY MAKERS OF THE CELEBRATED—

"SMOKELESS ◇ DIAMOND"

"Amberite" & "Diamond ◇ Grain" Sporting Gunpowders.

CORDITE AND ALL KINDS OF MILITARY POWDERS.

CURTIS'S & HARVEY, HEAD OFFICE: 3, Gracechurch St. LONDON, E.C.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT-WOOD'S OFFICES, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.
TELEPHONE No. 4680 GERRARD.

ROYAL UNITED SERVICE INSTITUTION

PATRON.

HIS MAJESTY KING GEORGE V.

VICE-PATRONS.

General H.R.H. PRINCE CHRISTIAN OF SCHLESWIG-HOLSTEIN, K.G., G.C.V.O.

Admiral of the Fleet *Right Hon. Lord* JOHN HAY, G.C.B.

PRESIDENT.

Field-Marshal H.R.H. DUKE OF CONNAUGHT, K.G.

VICE-PRESIDENTS.

Field-Marshal the *Viscount* WOLSELEY, K.P., G.C.B., O.M., G.C.M.G. (1905).
Field-Marshal *Right Hon.* the *Earl* ROBERTS, V.C., K.G., K.P., G.C.B. O.M., G.C.S.I., G.C.I.E., V.D. (1905).
Vice-Admiral *H.S.H. Prince* Louis of BATTENBERG, G.C.B., G.C.V.O., K.C.M.G., A.D.C. (1906).
Colonel *Right Hon. Sir* J. H. A. MACDONALD, K.C.B., V.D. (1908).
Field-Marshal *Lord* METHUEN, G.C.B., G.C.V.O., C.M.G. (1911).
Admiral of the Fleet the *Lord* WALTER KERR, G.C.B. (1912).

CHAIRMAN.

Brigadier-General H. H. WILSON, C.B., D.S.O., Director of Military Operations.

VICE-CHAIRMAN.

Vice-Admiral *Sir* A. M. FIELD, K.C.B., F.R.S.

MEMBERS OF THE COUNCIL.

Major-General E. H. H. ALLENBY, C.B., Inspector of Cavalry.
Lieut.-General *Sir* R. S. S. BADEN-POWELL, K.C.B., K.C.V.O.
Captain A. G. BALLARD, R.N., Director of Operations, Admiralty War Staff.
Commander CARLYON BELLAIRS, R.N. (retired).
Colonel the *Lord* BINGHAM, 5th Bn. The London Regiment.
Lieut.-General J. H. BOR, C.B., C.M.G., R.M.A., Extra Equerry to The King.
Major-General *Hon.* J. H. G. BYNG, C.B., M.V.O., Commanding East Anglian Division.
Commander W. F. CABORNE, C.B., Royal Naval Reserve.
Major-General *Sir* T. FRASER, K.C.B., C.M.G.
Lieut.-Colonel *Honble.* T. F. FREMANTLE, V.D., The Buckinghamshire Battalion, the Oxfordshire and Buckinghamshire Light Infantry.
Lieut.-Colonel A. St. L. GLYN, 10th Bn. Middlesex Regiment.
Colonel *Sir* LONSDALE A. HALE, late R.E.
Colonel *Sir* W. A. HILL, K.C.B. late 3rd Bn. The Gloucestershire Regiment.
Lieut.-General H.D. HUTCHINSON, C.S.I.
Captain T. JACKSON, C.B., M.V.O., R.N. Director of Intelligence, Admiralty War Staff.
Brigadier General F. I. MAXSE, C.V.O., C.B., D.S.O., Commanding 1st (Guards) Infantry Brigade.
Colonel A. W. MONEY, C.B., General Staff, War Office.
Admiral of the Fleet *Sir* G. H. U. NOEL, K.C.B., K.C.M.G.
Colonel F. C. ROMER. C.B., C.M.G., 4th Bn. Lancs. Fusiliers.
Rear-Admiral R. G. O. TUPPER, C.V.O.
Colonel F. D. V. WING, C.B., Assistant Adjutant-General, R.A.

Secretary, Curator and Chief Executive Officer.

Lieut.-Colonel A. LEETHAM, F.S.A., late Royal Monmouthshire, Royal Engineers and 13th Hussars.

Librarian.

Major C. H. WYLLY, late 1st Bn. South Staffordshire Regiment.

Editor.

Major H. A. L. H. WADE, late R.A.

Assistant Secretary and Curator.

2nd Lt. A. N. A. PINHEY, 12th Bn. The London Regt.

Auditors.

Messrs. WILDE & FERGUSON DAVIE, Chartered Accountants. 61½, Fore Street, E.C.

The undermentioned can become members by intimating their wish to the Secretary, and either forwarding to him their subscription, or giving him a written authority on their bankers or agents for its payment:—Commissioned officers of the Royal Navy, Regular Army, Royal Marines, Special Reserve, Reserve of Officers, Militia, Indian and Colonial Naval and Military Forces, Yeomanry, Territorial Force, Royal Naval Reserve, Volunteer Corps, and Cadet Battalions and Corps, as published in the Official Navy and Army Lists, together with retired officers of the same whose names are retained in the Navy or Army Lists, and Naval Cadets, and Cadets of the Royal Military Academy, Woolwich, Royal Military College, Sandhurst, and Royal Military College, Kingston, Canada, on the recommendation of their commanding officers, Chairmen and members of the Territorial Force Associations, and Secretaries of the same.

Officers retired from the various Services enumerated above, whose names do not appear in the Navy or Army Lists, are eligible for election by ballot on the recommendation, on personal knowledge, of two members of the Institution.

The terms of subscription are:—

Annual. £1 1s. 0d. entrance; and £1 1s. 0d. annual, payable on the 1st January each year.

Life. £15, payable in one sum.

Life. £15 15s., payable in three instalments of Five Guineas each; the first on joining the Institution, the others on the 1st January of each of the succeeding two years.

Members joining after the 1st October in any year are not called upon for any subscription the following year.

An extra payment of Ten Shillings entitles a member in the United Kingdom to the loan of Four Volumes at a time from the Library for a period of twelve months from the date of the subscription.

When a member desires to pay his subscription through his banker or agent, he should send to the Secretary a written authority as follows:—

To (Banker or Agents)

On receipt of this order please pay to Secretary, Royal United Service Institution, or order, my subscription to that Institution (according to the terms above).

Name in full.

Rank, Ship, or Regiment.

Address to which Journals and other communications should be sent.

Officers of the Indian and Colonial Naval and Military Forces, temporarily in the United Kingdom, may become members for a period of six months on payment of Shillings and Sixpence, or One Guinea for a period of twelve months; members of the United Service Institution of India, for six months on payment of Five Shillings.

The Institution contains the best professional Library in the United Kingdom; an excellent collection of Maps and Charts; Reading and Smoking Rooms provided with the leading papers, periodicals, and writing materials; an interesting Museum and a Theatre in which lectures upon professional subjects, followed by discussion, are frequently given; and is open daily from 10 to 7 except Sundays, Christmas Day and Good Friday.

The Journal, published monthly, is sent post free to all members. It contains the lectures given in the Theatre, articles on professional subjects, naval and military notes, book notices, &c.

The Royal United Service Institution,

WHITEHALL, S.W.

FORM OF BEQUEST

I Bequeath to THE ROYAL UNITED SERVICE INSTITUTION

the sum of £ _____ (free of duty).

or (in case of a specific legacy) my _____ (free of duty).

to be applicable for the general purposes of such Institution.

And I Declare that the receipt of the Secretary, or other proper officer for the time being of such Institution, shall be a sufficient discharge for the same.

HORLICK'S MALTED MILK

THE IDEAL FOOD DRINK.

Refreshing, Invigorating, Sustaining. Gives Strength and Stamina and Keeps you fit.

PREPARED IN A MOMENT WITH WATER. NO COOKING.

The wholesome nutrition of pure milk and choice malted grain. An excellent table beverage, delicious in the morning, soothing at night. A valuable addition to the dietary of anyone following the accepted teachings of physical culture experts. Non-Alcoholic. Supplies energy with absolutely no unpleasant after-effects.

In Glass Bottles, **1/6, 2/6, 11/-,** at all Chemists and Stores. Liberal Sample for trial free by post on request.

Horlick's Malted Milk Company, Slough, Bucks, England.

TRADE MARK ST REGISTERED

LANGUAGE BOOKS

For the NAVAL, MILITARY and CIVIL SERVICES.

Marlborough's **"SELF-TAUGHT"** Series

Of EUROPEAN AND ORIENTAL LANGUAGES.

Containing Classified Vocabularies, Idiomatic Phrases and Sentences, Commercial Trading, **Naval** and **Military** Terms, Travel Talk for Railways, Steamers, etc. With **English Phonetic Pronunciation.** Elementary Grammar, Tables of Money, Weights and Measures, etc., etc.

	Red Cloth.	Blue Wrap.		Red Cloth.	Blue Wrap
ARABIC (Syrian) Self-taught	2/6	2/0	**JAPANESE Self-taught** ...	2/6	2/0
BURMESE "	6/0	5/0	**PERSIAN** " ...	2/6	2/0
EGYPTIAN (Arabic) "	2/6	2/0	**TAMIL** " ...	2/6	2/0
HINDUSTANI "	2/6	2/0	**TURKISH** " ...	2/6	2/0

HINDUSTANI SELF-TAUGHT and GRAMMAR (In one volume, Red Cloth) ... **5/0**
JAPANESE " " " " " ... **7/6**
TAMIL " " " " " ... **7/6**

For a Complete List write for No. 31 Catalogue.

Sold by Booksellers & Bookstalls. **London: E. MARLBOROUGH & CO., 51, Old Bailey, E.C.**

H.B. Irving

says: "The De Reszke Cigarettes are delightful to smoke."

ACTORS, Operatic Singers—men whose throats are highly sensitive to anything of a harsh or injurious nature—always smoke "De Reszke" Cigarettes. Rich in flavour, of delightful aroma—famous throughout the civilised world for their exquisite mildness and perfect purity—

"De Reszke" CIGARETTES

contain no single characteristic to offend the tastes of the most critical judges.

Two kinds. In one quality only—the best.

Tenor (Turkish) - - 6/3 per 100; 3/4 per 50; 1/9 per 25.
American - - - 5/3 per 100; 2/8 per 50; 1/4 per 25.

To be obtained wherever good cigarettes are sold, or post free from J. Millhoff & Co., Ltd., 17, Down Street, Piccadilly, London, W.

PROFESSIONAL AND BUSINESS CARDS.

HUNTERS. HUNTERS. HUNTERS.

High-class Genuine Made Hunters, reliable in every way, with perfect manners, good jumpers, and
WARRANTED SOUND,
5, 6, and 7 years, from 12 to 16 stone and upwards. Regularly hunted last season with noted packs.
W. O. SMETHURST, Walshaw, BURY, LANCASHIRE.

HUMPHREYS & CROOK,

Tailoring Dept.:
3, HAYMARKET, PALL MALL.

Equipment & Taxidermy Dept.:
2 & 3, SUFFOLK STREET, PALL MALL.

CRAIG & DAVIES

MILITARY & CIVIL BOOTMAKERS,

FRANCIS STREET, WOOLWICH;
45, GLASSHOUSE ST., REGENT ST., W.;
40, High St., Aldershot; and York Town, Camberley.

Jones, Chalk & Dawson,

TAILORS & MILITARY OUTFITTERS,

6, Sackville Street, London, W.

E. TAUTZ & SONS,

BREECHES MAKERS,
SPORTING TAILORS
ONLY ADDRESS:
485, Oxford Street, W.
Telephone: 3633 Gerrard. Telegraphic Address: "Buckskins, London.

ESTABLISHED 1820.

D. WILLIAMSON,

Practical Gunmaker,
3, Waterloo Bridge Road, LONDON.
GUNS, RIFLES & AMMUNITION.
FULL Price List on Application.

THE OKANAGAN VALLEY, B.C.

KELOWNA

The most noted fruit growing district in
BRITISH COLUMBIA.
An illustrated booklet free on application to—
The British Empire Agency Ltd.,
11, Haymarket, S.W.

The GILBERT-WOOD PRESS

(C. GILBERT-WOOD, F.R.G.S., M.R.S.A., M.J.I., Sole Proprietor).
Newspaper Proprietors, Publishers, Lithographic & Letterpress Printers, etc.,
NORFOLK HOUSE,
VICTORIA EMBANKMENT, *LONDON, W.C.*
SOLE Advertisement Contractors to this Journal and also to most other Official Service Publications.
Telegrams: GILBERTWOOD, LONDON. Telephone: 4680 Gerrard.

HEALTH RESORT AND HOTEL ANNOUNCEMENTS.

LEAMINGTON SPA,

WARWICKSHIRE.

Applicants desirous of PURCHASING or RENTING, for long or short tenancies, Furnished or Unfurnished RESIDENCES, LANDED ESTATES, &c., can receive full particulars and Register Free, of WALTER COLLINS & SON, 47, The Parade, Leamington Spa. Established 1881.

Co. Donegal, Ireland.

ROSAPENNA HOTEL

Large Lounge, Dining Billiard, Smoking and Writing Rooms. Private Suite of Apartments. Bedrooms with Bathrooms en suite. Sanitary Arrangements Perfect. Electric Light in every room. Salmon, Sea Trout and Brown Trout Fishing. Reserved to Visitors free of charge. First-class Golf Links (18 Holes) encircle the Hotel. Excellent and Safe Bathing.
Own Laundry. Good Motor Garage (Resident Engineer), Private Bakery. For full particulars apply to the Manager.

ALDERSHOT.

THE ROYAL HOTEL.

The oldest established in the town.
Close to Artillery, Badajos, Talavera and Salamanca Barracks, also Cavalry Barrack Gates. Five minutes from South Camp and Aldershot Town Station. Excellent cuisine. Attendance perfect. Terms on application, and most moderate. Telephone No. 17.
A. HEARNE, Proprietor.

RAMSGATE.

The Granville Hotel.

Beautifully situated on the high cliffs overlooking Sea and Public Gardens. A magnificent position. The most comfortable Seaside Hotel on the south Coast.
Excellent and complete Turkish Bath, with Sea Water Plunge; also Ozone and other Baths. Hot and Cold Sea Water in Bath Rooms. Electric Light everywhere.

COLLEGES, SCHOOLS, TUTORS, &c.

Mr. E. CARLISLE, M.A. (Cantab)
AND
Major M. H. GREGSON (late R.E.)

Prepare Candidates for all Army Examinations at
5 & 7, Lexham Gardens, W.

PRINCESS HELENA COLLEGE
EALING, W.

President—H.R.H. The PRINCESS CHRISTIAN.
Visitor—The LORD BISHOP OF LONDON.
Principal—MISS PARKER.

BOARDING and DAY SCHOOL for the Daughters of Gentlemen. Special attention to Languages. English, Art, Music. Holidays arranged for if required. Large Grounds. Fees, 66 Gns. to 75 Gns. a year. Officers' Daughters 66 Gns. a year.

Medical, Legal, Navy & Public School Examinations.

Mr. WILLIAM H. TAYLOR
(*1st LL.B. London.*)
Coaches for all Entrance Examinations for Public Schools, etc., etc.
2, Middle Temple Lane, London, E.C.

A Practical Training College

for Ladies and Gentlemen wishing to learn Farming, Corn Growing, &c., Poultry Farming, Gardening, Fruit-Growing, Care of Bees. Long or short courses. Excellent References.
Principal—
Lane House BRANDESBURTON, HULL.

PUBLISHERS AND PUBLICATIONS.

HUGH REES, Ltd.,

Military and Naval Booksellers, Stationers and Publishers,

5, REGENT STREET, S.W.

And at CAMBERLEY, SURREY.

Military and Naval Books of all descriptions are kept in Stock and can be supplied without delay.

PROBSTHAIN & CO.

Oriental Booksellers and Publishers.

41, Great Russell Street, London, W.C.

Large Stock of Oriental Books—India, China, Japan, Africa, Persia, Turkey.
Oriental Grammars and Dictionaries.

Special Catalogues post free on application.

"The Shipbuilder"

Price 6d. net. (Postage 4d. extra).

The Quarterly Journal of The Shipbuilding, Marine Engineering and Allied Industries.

JANUARY NO., NOW READY.

(Published 15th January, 15th April, 15th July, & 15th October.)

C. GILBERT-WOOD, Norfolk House, Victoria Embankment, London, W.C.

"Lest we forget."

'DEFENDERS OF OUR EMPIRE'

Biographies of the Nation's Heroes.

PART II will be published during the current year (1912). Further particulars as to the Important Officers whose Biographies and Autographed Photographs will appear, will be Advertised in due course. **Price 1 - net.**

A few copies of PART I. (first issued in 1908 Second Edition 1910), are still on Sale, and can be obtained from the Publishers,

THE GILBERT-WOOD PRESS,
Norfolk House, Victoria Embankment, W.C.

THE 'OLYMPIC' & 'TITANIC'

SPECIAL SOUVENIR NUMBER
OF "THE SHIPBUILDER."

NOW READY. Price 2/- net. (post free 2/4)

Contains full particulars, plans and special plates illustrating these, the largest vessels in the World, Limited Edition. Copies should be secured at once.

C. GILBERT-WOOD, Norfolk House,
Victoria Embankment, W.C.

"THE CAVALRY JOURNAL."

QUARTERLY. **Price 2s. 6d. Net.**

Published by Authority of the Army Council, and under the Direction of General Sir J. D. P. French, G.C.V.O., K.C.B., K.C.M.G., Colonel of 19th Hussars, Inspector-General of the Forces, assisted by Lieut.-General *Sir* R. S. S. Baden-Powell, K.C.B., K.C.V.O.

JANUARY, APRIL, JULY and OCTOBER.

C. GILBERT-WOOD, Norfolk Street, W.C.

ARMY & NAVY JOURNAL.

Established 46 Years.

PUBLISHED WEEKLY, 20, VESEY ST. New York, N.Y., U.S.A.

Recognised at home and abroad as the leading Military and Naval periodical in the United States.

Subscription £1 9s., including postage.

Sample copy sent on request.

Ready Shortly. *"The Gilbertwood" Series.*

"THE PROFESSION OF ARMS."

This interesting and instructive little work is written with the sole object of dispelling illusions as to the Army as a Profession; it's object is not merely to extol the Soldier's calling, but to make it more generally understood. **Price 3d. net.**

London: C. GILBERT-WOOD, Norfolk House, Victoria Embankment, W.C.

"THE JOURNAL OF THE UNITED SERVICE INSTITUTION OF INDIA."

Published Quarterly. This old-established Publication appears Jan., April, July and Oct. of each year, and can now be obtained direct from the London Publisher. **Price 2/6 Net.**

SIMLA: United Service Institution of India.
LONDON: C. Gilbert-Wood, Norfolk House, W.C.

"To preserve Peace be prepared for War."

The Indian Volunteer Record And Military News,

London, Calcutta, and Bombay.

A Fortnightly Review of Indian Military Matters, printed in India.

"By far the smartest little service paper published in the Indian Empire."

EDITOR: CAPTAIN JAMES WYNESS.

London Managing Editor: C. GILBERT-WOOD, F.R.G.S.

SOCIETIES, HOMES AND CHARITIES.

MARINE SOCIETY.

TRAINING SHIP "WARSPITE,"

PATRON - - H.M. THE KING.

The Society maintains the Training Ship "Warspite" at Greenhithe.

CONTRIBUTIONS EARNESTLY SOLICITED.

Annual Subscriptions and Donations gratefully received by the
Secretary, Lieut. H. T. A. BOSANQUET, R.N.,
Clarks Place, Bishopsgate, E.C.

Hundreds of old Soldiers

are helped every year by

THE CHURCH ARMY.

FUNDS and partly-worn clothing are URGENTLY NEEDED. Cheques should be crossed "Barclays', a/c Church Army," payable to Prebendary Carlile, Hon. Chief Secretary, 55 Bryanston Street, W.

Metropolitan Drinking Fountain and Cattle Trough Association.

The Committee very earnestly APPEAL for LIBERAL HELP to continue a work which has done so much to promote Temperance and alleviate suffering.

CAPT. W. SIMPSON, *Secretary*,
70, Victoria Street, S.W.

Animal Hospital and Institute.

In response to appeals, we have now been able to establish Relief Horses for both Waterloo and Blackfriars bridges, and by the enormous number of horse drawn vehicles that have been given assistance to, proves their necessity. May we therefore respectfully ask for some financial assistance to enable us to carry on this good work and so relieve our dumb friends who may at times have their strength overtaxed on the hill in question

Subscriptions may be forwarded to the Secretary,
75, KINNERTON STREET, KNIGHTSBRIDGE.

METROPOLITAN AND CITY POLICE PENSIONERS' EMPLOYMENT ASSOCIATION.

This Association is formed to afford the Public the benefit of the services of deserving Pensioners from the Metropolitan and City Police Forces, whose pension, combined with their previous Good Conduct, Sobriety and Training, affords a guarantee for their reliability for either Permanent or Temporary Employment, in uniform or plain clothes, in Town or Country.

7, VICTORIA STREET, WESTMINSTER, S.W.
Wm. BAKER, Secretary.

Dr. Barnardo's Homes

Maintain 9,400 Children.

300 Boys constantly in training FOR THE NAVY.

Cheques payable "Dr. Barnardo's Homes."
Head Offices, 18 to 26, STEPNEY CAUSEWAY, E.

BRITISH COLUMBIA

With a Moderate Capital (or income)
you can obtain in

SOUTH EAST KOOTENAY

PROFITABLE FRUIT LANDS
AND THE ADVANTAGES OF
IDEAL CLIMATE - - -
BIG GAME SHOOTING - -
FISHING - - - - -

and congenial neighbours, as there are many retired Military and Naval Officers and University men already settled in the district. The opportunities for **"A Younger Son"** are unsurpassed, as land is still reasonable in price, but rapidly rising in value.

An illustrated booklet "THE FRUITLANDS OF EAST :: :: KOOTENAY" will be sent free on application. :: ::

THE BRITISH EMPIRE AGENCY, Ltd., 11, Haymarket, LONDON, S.W.

BY ROYAL WARRANT

THE
Goldsmiths & Silversmiths Company, LTD.

With which is incorporated The Goldsmiths Alliance, Ltd. (A. B. Savory & Sons), Established 1751.

Famous the World over for

DESIGN. QUALITY. VALUE.

"SERVICE" WATCH
GUARANTEED.

Gentleman's Keyless Lever Watch, specially adapted for Military use, and constant hard-wear, in Dust proof and Airtight Case.

WATCHES SENT ON APPROVAL.

Illustrated Catalogue
POST-FREE.

THE "SERVICE" WATCH.

IN OXIDISED STEEL CASE -	£2 10 0
IN SOLID SILVER CASE -	£3 10 0
IN 18-CARAT GOLD CASE -	£12 0 0

THE PUBLIC SUPPLIED DIRECT AT MANUFACTURERS' CASH PRICES.

112, REGENT STREET, LONDON, W.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT WOOD'S OFFICES, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.
TELEPHONE No. 4680 GERRARD.

RANGEFINDERS

— and —

Fire Control Instruments

Barr & Stroud
MANUFACTURE
RANGEFINDERS
OF NUMEROUS
SIZES FROM
26 INCHES
TO 30 FEET BASE.

Artillery Rangefinder

1 METRE BASE. TYPE F.T. 16.

The Approximate uncertainty of observation with this instrument under favourable circumstances may be stated as:—

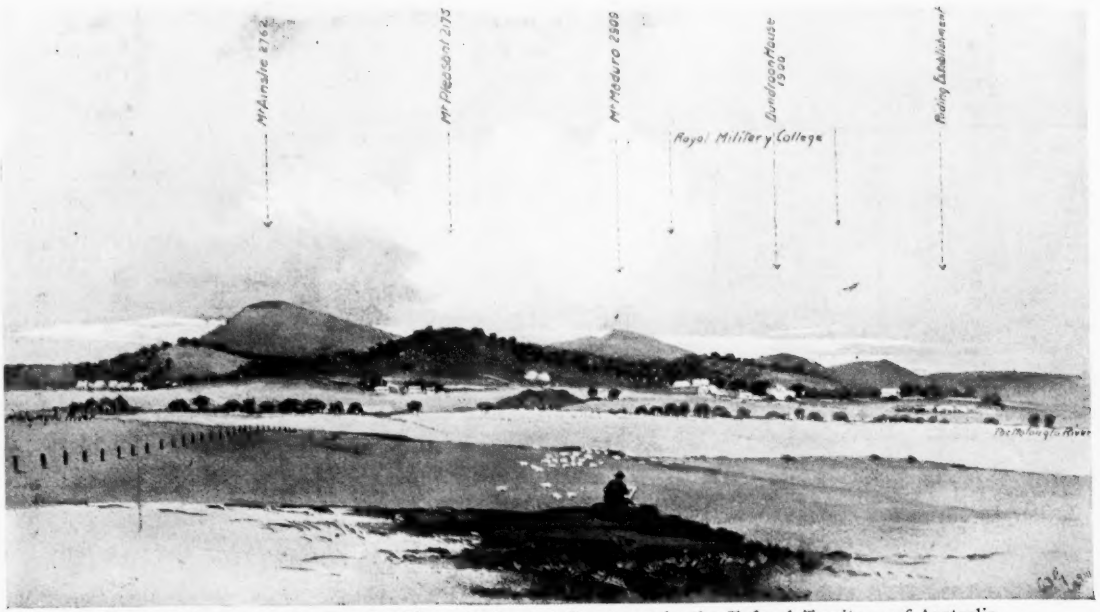
1 yard at 500 yards.
5 „ „ 1000 „
45 „ „ 3000 „

BARR & STROUD

ANNIESLAND, GLASGOW.

The opening of the Royal Military College, Duntroon, by his Excellency the Governor-General of the Australian Commonwealth. Cadets in temporary uniform.

Reproduced from the First Annual Report on the College. *(See Page 445).*



View of the site of the Royal Military College at Duntroon in the Federal Territory of Australia.

Reproduced from the First Annual Report on the College. (See Page 445).

SUBJECT OF THE NAVAL ESSAY, 1912.

Divergent views having been expressed as to the exact meaning of the title of the subject for the Naval Prize Essay for 1912, the Council wish to notify that the meaning is, "What is the influence of oversea commerce on the operations of war? How did it affect our Naval Policy in the past, and how does it in the present day?"

ROYAL UNITED SERVICE INSTITUTION.

MARCH, 1912.

SECRETARY'S NOTES.

I.—VICE-PRESIDENT.

Admiral-of-the-Fleet the Lord Walter Kerr, G.C.B., has been appointed a Vice-President of the Institution.

II.—COUNCIL.

At the Anniversary Meeting on Tuesday, March 5th, the following officers were appointed to the vacancies on the Council:—

Colonel Sir W. A. Hill, K.C.B.
Commander W. F. Caborne, C.B.
Colonel C. W. Trotter.
Captain A. G. Ballard, R.N.
Commander C. W. Bellairs, R.N. (retired).
Captain T. Jackson, C.B., M.V.O., R.N.
Colonel Sir L. A. Hale.
Major-General E. H. H. Allenby, C.B.
Colonel F. D. V. Wing, C.B.
Major-General Hon. J. H. G. Byng.
Colonel Lord Bingham.
Lieut.-Colonel A. St. L. Glyn.

II.—NEW MEMBERS.

The following officers joined the Institution during the month of February:—

Captain H. D. Goldsmith, Duke of Cornwall's Light Infantry.
Captain C. E. Le Mesurier, R.N.
Captain N. H. Moore, 3rd Bn. West Riding Regiment.
Second Lieutenant W. G. Holmes, R.G.A.
Captain G. T. Seabroke, East Lancashire Regiment.
Captain C. W. B. Birdwood, 6th Gurkha Rifles.
Lieutenant J. E. Wheeler, R.G.A. (T.F.).
Second Lieutenant J. H. Leigh, 4th Bn. Seaforth Highlanders.
Colonel A. W. Proudfoot, late Indian Army.
Colonel G. R. Crawford, Indian Army.
Captain F. A. Forster, Royal Fusiliers.
Second Lieutenant Sir R. Walker, Coldstream Guards.
Second Lieutenant C. M. Cottrell-Dormer, Coldstream Guards.
Second Lieutenant W. A. L. Stewart, Grenadier Guards.
Lieutenant A. P. Hohler, 10th Bn. Middlesex Regiment.
Second Lieutenant F. B. A. Fargus, 9th Bn. London Regiment.
Captain A. G. Bayley, Oxfordshire and Buckinghamshire Light Infantry.

IV.—GOLD MEDAL ESSAY, 1911.

The Council have awarded the Gold Medal of the Institution, together with the first Trench-Gascoigne Prize of Thirty Guineas for the Military Essay of 1911, to Captain H. T. Russell, R.A. (retired).

The second Trench-Gascoigne Prize of Twenty Guineas to Major H. L. Pritchard, R.E.

The Essay of Major F. R. Hicks, Hampshire Regiment, is recommended for publication.

The following officers kindly undertook the duty of Referees, and to whom the thanks of the Institution were duly recorded at the Annual Meeting :—

General Sir H. J. T. Hildyard, G.C.B.
Lieut.-General Sir J. Wolfe-Murray, K.C.B.
Major-General E. A. Altham, C.B., C.M.G.

The subject of the Essay was as follows :—

"The best National System for providing the necessary Military Force : (*i.*) to secure the safety of the United Kingdom on land; (*ii.*) to support the Defence of the Empire; (*iii.*) to assist in maintaining the balance of power in Europe;"

and 18 Essays were submitted.

V.—SUBJECT OF THE NAVAL ESSAY, 1912.

Divergent views having been expressed as to the exact meaning of the title of the subject for the Naval Prize Essay for 1912, the Council wish to notify that the meaning is, "What is the influence of oversea commerce on the operations of war? How did it affect our Naval Policy in the past, and how does it in the present day?"

VI.—MILITARY HISTORY LECTURES.

A course of eight lectures in military history on "The operations in the Eastern theatre of the American War of Secession in 1862 and 1863," set for the May Army Promotion Examination, will be given on the following dates, at 4 p.m., the Lecturer being T. M. Maguire, Esq., LL.D., Barrister-at-Law :—

Tuesday, April 16th.	Tuesday, April 30th.
Friday, April 19th.	Friday, May 3rd.
Tuesday, April 23rd.	Tuesday, May 7th.
Friday, April 26th.	Friday, May 10th.

The fee for the course of lectures is one guinea for members of the Institution and two guineas for non-members.

Application to attend, enclosing the fee, to be addressed to the Secretary, Royal United Service Institution, Whitehall, S.W.

VII.—LECTURES.

1.—Change of Date.

The lecture announced on the lecture card to take place on Wednesday, April 17th, "The Strategical Action of Cavalry," by Brigadier-General H. De B. De Lisle, has been unavoidably postponed to Wednesday, April 24th, 3 p.m. Major-General E. H. H. Allenby, C.B., Inspector of Cavalry, will preside.

II.—Extra Lecture.

Wednesday April 17th, 3 p.m., "Aircraft for Sea Service," by Lieutenant F. L. M. Boothby, R.N. Rear-Admiral R. H. S. Bacon, C.V.O., D.S.O., will preside.

VIII.—A WELLINGTON and WATERLOO EXHIBITION (Preliminary Notice.)

The Council have decided to hold in 1915 an Exhibition of Wellington and Waterloo relics, and hope that Members of the Institution and others possessing such relics and articles of interest will kindly lend them when the time comes. They are giving this early notice as it is understood that other Exhibitions may be organized of the same description.

IX.—CORRESPONDENCE.

All the correspondence of the Institution, including that with reference to the Library, Lectures, Museum and the JOURNAL (with the exception of those letters for the perusal of the Editor only) should be addressed to the Secretary, and not to individual Members of the Staff by name.

X.—LIBRARY RESEARCH.

Mr. R. Dane (late Sergeant-Major, R.E.), formerly for many years the Library Clerk, is prepared to conduct researches for Members in this or any other of the London Libraries.

XI.—ADMISSION TO LECTURES.

Members are reminded that they are able to introduce only two visitors to each Lecture; when a Member does not attend himself it is necessary that visitors should hand in his visitors' card at the entrance.[1]

XII.—PUBLICATIONS.

The following may now be obtained on application :—

Library Catalogue, 5s. 6d.
JOURNAL Index from 1887 to 1907, 1s.
Museum Catalogue with Index to 1912 (illustrated), 1s.
Whitehall Palace, 1s.
Execution of King Charles I., 6d.
Weapons in the Museum (illustrated), 2s. 6d.

XIII.—ADDITIONS TO MUSEUM.

(3373). Remnants of the Regimental Colour of the 33rd Regiment (the Duke of Wellington's), together with the tassels, pole-heads and shoes, which were carried at the Battles of Quatre Bras and Waterloo in 1815., They became the property of the late Lieut.-Colonel J. M. Harty, K.H.—Deposited by Miss Vickers.

---

[1] Until further notice Ladies cannot be admitted.

(3374). A French officer's tri-coloured Cockade, taken at Waterloo, and formerly the property of the late Lieut.-Colonel J. M. Harty, K.H. 33rd Regiment.—Deposited by Miss Vickers.

(3375). A pair of Flint-lock Pistols, picked up on the Battlefield of Waterloo by the late Lieut.-Colonel J. M. Harty, K.H., 33rd Regiment.—Deposited by Miss Vickers.

(3376). Autograph letter of F.M. the Duke of Wellington written to the late Lieut.-Colonel J. M. Harty, K.H., relative to the request that the 33rd Regiment should be called the Duke of Wellington's Regiment.—Deposited by Miss Vickers.

(3377). Small Writing Table bearing the following inscription:—"Sevastopol, September 10th, 1855." The table was presented to her late Majesty Queen Victoria, and is believed to be the one on which the armistice with Russia was signed by the Allies on September 9th, 1855.—Deposited by **His Majesty King George V.**

(3378). A Boer Shell; on the stand is the following inscription:—"To His Majesty King Edward VIIth, Colonel-in-Chief, Imperial Yeomanry. This shell, made in Johannesburg by the Boers, was found on a R.F.A. gun which had been taken by the enemy at Colenso, and was retaken by the 1st Brigade Imperial Yeomanry from the Commando of Commandant De Beers at an action at Rooival, Transvaal, S. Africa on September 19th, 1900.—Chesham, Brig.-General, commanding 1st Brigade Imperial Yeomanry."—Deposited by **His Majesty King George V.**

(6408). Officer's Shako Plate of the 80th Foot, worn from 1855 to 1861.—Given by Miss H. Sadleir.

(6409 & 6410). Series of Commissions of General Robert Alexander, Hon. East India Company's Service, viz.:—Ensign 1819, Lieutenant 1819, Captain 1826, Major 1836, Adjutant-General Madras Army with rank of Lieutenant-Colonel 1839, Lieutenant-Colonel 1841, Colonel 1851. (These Commissions are in duplicate, one being Hon. East India Company's, the other being that of the Commander-in-Chief in India). Major-General 1854, Lieutenant-General 1865 (these are signed by H.M. Queen Victoria). This officer was born in 1798, and joined the Royal Navy as a Supernumerary Midshipman in 1810, saw much service in the Mediterranean in engagements with the French Toulon Fleet, was present at the Siege of Genoa, the Expedition to Corsica and the Surrender of Naples and the Neapolitan Fleet in 1815. (The certificate of his discharge from the Navy is with the Commissions). He died in 1879, having previously been promoted to the rank of General in 1870. —Given by Major-General R. Anderson.

(6411). A Silver Challenge Cup, presented by Colonel A. Hill, 3rd Cheshire Regiment, to the Militia Rifle Association; on the

amalgamation of that Association in 1911 with the Army Rifle Association, it was by his wish given to the Museum of the Royal United Service Institution.—Given by the Council of the late Militia Rifle Association.

(6412). Mounted Officer's Sabretasche of the Grenadier Guards, discontinued in 1902.—Given by Lieut.-Colonel A. St. L. Glyn, 10th Bn. Middlesex Regiment.

(6413). Photograph of a water-colour painting by Lieut. St. Aubin, 76th Foot (killed at Aligarth, September, 1803), of the Siege of "Sásni" (near Agra), which lasted from September 23rd 1802, to February 6th, 1803, when it was taken by storm, Lord Lake being in personal command. The colour of the uniforms in the original painting are:—Artillery, blue coats with narrow yellow facings, officers with gold lace collars and epaulettes, black top hats with white plumes. The other officers are in red coats. Native Infantry, faded red coats, black top hats with black plumes, breeches and long gaiters. The officer in top boots with a large plume wears a red coat, and is possibly General Lord Lake.—Given by J. A. Devenish, Esq.

(6414). A contemporary print in colours of Field Marshal Blücher in Hussar uniform.

(6415). An engraving of Peter Paul Reubens from the picture by Van Dyke.—Given by Captain K. R. Wilson, 12th Bn. London Regiment.

(6416). Gold and Silver Medals (2) struck at H.M. Mint in India to commemorate the Durbar held at Delhi, on December 12th, 1911, in honour of His Majesty King George V. Coronation.—Given by the Secretary of State for India.

(6417). Guidon of a Fencible Cavalry Corps (Corps unknown), previous to the Union, bearing the motto "In defence."—Given by Colonel Albert Melly, V.D., Lancashire R.F.A.

PRINCIPAL ADDITIONS TO LIBRARY,

February, 1912.

The Knights of England. By W. A. Shaw. 2 vols. 4to. 26s. (Sherratt & Hughes.) London, 1906.

The Life of Admiral Lord Anson, the Father of the British Navy, 1697-1762. By Capt. W. V. Anson, R.N. 8vo. 7s. 6d. Illustrated. (John Murray.) London, 1912.

The Railway Conquest of the World. By F. A. Talbot. 8vo. 6s. Illustrated. (William Heinemann). London, 1911.

Procédés de Liaison dans le Domaine Tactique. By Chef de Bataillon Niessel. 8vo. 1s. (Henri Charles-Lavauzelle). Paris, n.d.

La Liaison des Armes. By Général Percin. 8vo. 1s. 8d. (R. Chapelot et Cie.) Paris, 1909.

Tactique des Trois Armes. By Général Kessler. 8vo. 2s. 6d. (R. Chapelot et Cie.) Paris, 1903.

La Tactique des Trois Armes. By G. Mazel. 8vo. 3s. 6d. (Berger-Levrault et Cie.) Paris, 1880.

George the Third & Charles Fox—the concluding part of the American Revolution. By Sir G. O. Trevelyan, Bt. Vol. 1. 7s. 6d. (Longmans, Green & Co.) London, 1912.

Das Maschinengewehr im russisch-japanischen Krieg, und persönliche Erfahrungen über Kavallerie-Maschinengewehrabteilungen. By Rittmeister Heinrich Viktorin. 8vo. Illustrated. (Presented). (L. W. Seidel & Sohn). Vienna, 1911.

A **Parchment Roll** several yards long, and one foot wide, engrossed in floriated English characters (black letters) of large type, containing payments to Colonels of Regiments on the English Establishment, names of departmental officers, half-pay officers, certain pensions, the King's A.D.C.'s, etc. The Roll bears the endorsement "Anglia-St. Spencer Compton, Knt. of the Bath and Paymaster-General of his Majesty's Guards, Garrisons and Land Forces upon his Acct. for one year ended at Xtmas, 1725," etc. (Presented by Mr. Charles Dalton).

Bombay Government General Orders, from the 1st October, 1791 to the 31st January, 1793. MS. Med. fol. (Presented by Maj.-General E. A. H. Alderson, C.B.).

The Crimea & Indian Mutiny Veterans Association, Bristol, 1892-1912." Crown 8vo. (Presented by the Officers of the Association). Bristol, 1912.

THE JOURNAL
OF THE
ROYAL UNITED SERVICE INSTITUTION.

VOL. LVI. MARCH, 1912. NO. 409.

[Authors alone are responsible for the contents of their respective Papers.]

THE DEVELOPMENT OF OUR SYSTEM OF NATIONAL LAND DEFENCE.

BY COLONEL S. A. E. HICKSON, D.S.O.

On Wednesday, December 6th, 1911.

ADMIRAL SIR NATHANIEL BOWDEN-SMITH, K.C.B.,
in the Chair.

INTRODUCTORY REMARKS.

OVER and above organization and methods of National Mobilization for Defence I propose this afternoon to endeavour to trace in particular the origin and development of that spirit of national service which is itself the foundation of all National Defence. It is the fluctuations of this national spirit which above all endanger national security. At times we see it rising so high that the nation seems capable of achieving anything. At others it falls so low, the spirit of self-interest and party is so predominant, that nothing seems capable of arousing the people to preparation for combined action. Manifestly it is continuity of spirit which is desirable and necessary.

I am concerned to-day with Home Defence only, not with those feudal, mercenary and standing armies of which Mr. Fortescue has told the tale so inimitably. Our system of defence at home has always been distinct from our foreign service system of offence, and the maxim that principles abide, details only change, must be my excuse for taking my audience back for a time to remote periods of history. Historians have shown that it is the persistence of Saxon[1] influence in our institutions which

[1] I use "Saxon" as comprehending generally Angles, Saxons, and other Germanic races in contra-distinction to Norman.—S.A.E.H.

is the most remarkable feature of our history, and I hope to be able to convince you to-day that so high was the spirit of national service in defence of king and country above all, in our Saxon forefathers, that it not only became quite naturally the basis of our system of national defence, but also gave us that lead in those free democratic ideas and free forms of Government which have won for this country everlasting renown all over the world as the Mother of Parliaments. Thus not only remote Persia, but even still more remote Japan, and now China, are following our example.

Viewed from this standpoint, our history may be divided into six periods. In the first, the Saxon period, the national militia spirit of service is supreme, and as it ebbs we come to the second, the Norman and early English period, in which this Saxon spirit of national service for king and country, above all, struggles with the Norman spirit of feudal tenant service. Then in the third or Tudor period, the national spirit once more triumphs over feudalism, and aids in the 16th century in warding off three independent threats of invasion by Germany, France and Spain. But now follow great changes: in the fourth period the invention of gunpowder leads to the development of the musket and artillery. Each of the three arms becomes a speciality. The Revolution follows, and after it comes now a struggle between National Service and Professional armies. In the fifth period, it is not till towards the end of the 18th century that we see the national spirit once more rising to prominence; and in 1755 comes a new militia act, in 1794 the first Volunteer Act, and between 1803 and 1814, the militia is reformed and embodied for Home Defence. In the 6th period, i.e., after Waterloo, the national spirit once more disappears for a generation, till now we see it again rising in the form of a Territorial Army of the exact type of our Saxon forefathers, each county having to-day, its so-called Lord-Lieutenant, its County Association, and Territorial Force, exactly as in Alfred's time every county had its Earl or Ealdorman, each with his comitatus of select companions and Territorial fyrd. So true is it that principles endure, so strangely does Saxon influence persist in our history.

THE SAXON PERIOD.

(National Service in defence of King and Country above and before all).

Gibbon has shown how love of freedom, combined with study of the use of arms, was the primitive principle of all those Germanic races which, watching the degenerate Romans, eventually overthrew them and deluged Europe. The Saxons, Angles and Jutes brought this principle to England, and from it our forefathers gradually developed for us, on the one hand, representative government, on the other, universal national service. I mention universal or compulsory service with some reserve—I prefer the expression, national service,—but it is not indeed pos-

sible to avoid it in an historic lecture. For the guiding principle of our land defence from earliest day has been, that it is possible by means of universal service to collect in this country, of a sudden, at any threatened point, a sufficient and sufficiently-trained territorial force to contain an invader till a more highly organized central army can be moved up to crush him; and this without drawing men far out of their counties without denuding other parts of the country. It was in the 8th century that Saxon defensive principles first took shape in the form of the Saxon law known as "Trinoda Necessitas," which is only a latinized name for compulsory service, having reference to the three duties which it was held indispensable that every man should share—namely, the repair of roads and bridges, the repair of fortifications, and service in defence of his country. It was in Wessex, then becoming the supreme kingdom in England, that this principle seems to have been first applied to a county organization, each county being under its own Earl or Ealdorman nominated by the King, and it was this superior organization which, over and above its natural strength, enabled Wessex to keep out the Danes at a time when they subdued the greater part of Mercia and Northumbria. Again, later by his still more complete reorganization of this system, Alfred the Great was able to shake off the Danes, and, with his successor, to make England a united country, as it had never been before.

It was his vast experience, over and above his marvellous genius, which gave to Alfred the key to that guiding principle of our defence, to which I have already referred, of central well organized, and well armed armies supporting local territorial county forces distributed more especially along our coast. Alfred's difficulties were rapidity of concentration, and to feed his force in the field. What he did, therefore, was to divide the men of each county force or fyrd into two reliefs, so that one half was always at home getting food, whilst the other was absent under arms. Over and above this he made all owners of five hides Thegn-worthy. These Thegns—i.e., the half of those on duty, served with him, and formed a strong central army under his own orders. The remainder of the county levies served locally under their Earl or Ealdorman.

Thus, when the Danes landed in two main bodies in 893, wherever they went they were held by the local men of the county "fyrd" till the "king's force" could come up to crush them, and the two main forces of the enemy were kept apart much in the manner of Napoleon in 1814. Thus, says the historian,[1] "The Danes could no sooner appear in one place than a sufficient muster was assembled there without leaving the other quarters defenceless and disarmed."

Similar strategical ideas to these seem to underlie our plans for defence to-day. "Every hundred yards of coast," we have been told by Lord Haldane, in 1909, have to-day been con-

[1] Hume.

sidered, "and Territorial units have been allocated to these sections of the coast, and are being trained for their defence. Behind these there is being organized a central force, partly Regular and partly Territorial, which, should an outbreak of war approach, would be under its own commander-in-chief." Thus from Alfred's time to our own the strategical principle of defence has remained unaltered. But as a matter of organization there is one important difference. In Alfred's day national service was a matter of course, and what interests us to-day is whether under a voluntary system of training and enlistment it will be possible to collect with sufficient rapidity a sufficient and sufficiently trained force in any one part of the country, without denuding other parts, and without unduly interfering in time of war with the private avocations of that small and gallant force of Territorials which voluntarily trains in time of peace.

"NORMAN PERIOD."

(and preservation of the Saxon Oath of allegiance).

The strong spirit of national service which Alfred inspired, aided by his great power of organization and command, both naval and military, as already said, made England under his successors an united country such as she had never been before. But in course of time that apathy which insularity tenders to engender, again set in, and we have one of those fluctuations of the national spirit already referred to as so dangerous to security. Under Ethelred the Unready the fyrd system entirely broke down, and all national organization disappeared. The Danes, seeing our want of preparation, came again. They even for a while gained the mastery. The spirit of faction and party prevailed, and when the family of Godwyne at last became supreme, "the policy of Leofric, followed by the luke-warm patriotism of Edwin and Morcar, opened the way to the Norman Conquest by disabling the right arm of Harold." Heroic though Harold might be, strong though his central force of Hus-Carls might be, he had not the genius of command, the power of inspiring united action possessed by Alfred. Mr. Green describes his rule as a policy of mere national stagnation within and without sprung from the narrowness of conception of a mind which it is impossible to call great. But genius was arrayed against him; whilst Harold allowed his navy and southern forces to disperse, Duke William of Normandy, in spite of mutinies, kept his men together. Favoured at last by a fair wind at a time when the wind is normally adverse, and combating with success every other difficulty, he landed his 3,000 dinghies on our shores when least expected, unopposed, and in a few weeks England was a conquered country. Thus it is that a Napoleon or a Hannibal unexpectedly crosses the Alps, that a Wolfe conquers Quebec, and a conqueror overpowers England—in spite of all seeming impossibilities. A concurrence of three events only is required

—the man, the means, and the opportunity—to make the success of such surprises a certainty.

Nevertheless, we are proud of our Norman blood, and we have every reason to be grateful to the Norman conqueror who restored to us national unity, even though at such a tremendous sacrifice. For though he could not altogether exclude feudalism from us, he wished to rule as legally elected King of England, and to preserve the Saxon institutions. He had not been long our master before he recognised the superior value—to him especially—of the Saxon spirit of national service in defence of country and king before all, over the feudal spirit of tenant service. In 1086, therefore, at Salisbury, at the great Council summoned after the Doomsday survey, he accepted the old Saxon oath of allegiance, and caused "all landowners of substance in England, *whose vassals soever they were,* to become his men, and swear that they would be faithful to him *above all others.*" Thus was the old Saxon oath of allegiance made to take precedence for ever over local homage. Every man became, above and before all, the king's man. This, says Dr. Stubbs, "accounts for the maintenance of the national force of defence over and above the feudal array. The fyrd of the English, the general armament of the counties and hundreds was not abolished at the conquest, but subsisted even through the reigns of William Rufus and Henry Ist, to be reformed and reconstituted by Henry II., and in each reign it gave proof of its strength and faithfulness." Eventually, it emerged as our militia. As early even as the reign of King John, in 1205, and 1216, all men were ordered to assemble to resist the enemy's landing on pain of forfeiture and perpetual slavery.

EARLY ENGLISH PERIOD.

(Assize of Arms, Statute of Winchester).

It fell to the lot of Henry II. to give to the Saxon spirit of national Service in defence of king and country before all, the force of law. He found three different military systems current on his accession :—

1. Hired foreign mercenaries.
2. The feudal tenants in chivalry.
3. The territorial levies or Saxon fyrd.

The first of these he was bound to discharge by the terms on which he ascended the throne. The second, like William I., he regarded as by nature unreliable when not positively hostile. His natural policy, therefore, was also like William, to develop still further the national territorial force, and training of the people for home defence. He, therefore, strengthened our defensive system by the Assize of Arms, which is further interesting as being a very early application of the jury system. Duly appointed jurors in each district assessed the wealth of

the whole community of freemen who were divided into classes according to their wealth, and made to swear before magistrates that they would "have and carry these arms in the service of the king, according to his commands, in defence of king and country." By this means Henry II. sought and found a method of dispensing with the services of the barons in keeping order at home, whilst he incidentally founded that national system of training, which later was capable of furnishing a large reserve to our kings, even for service abroad. For from this national training, as revised by the Statute of Winchester, came the men raised by indenture and array, who, over and above the feudal tenants in chivalry, won for British arms such lasting glory at Crecy, Poitiers, and Agincourt

But the immediate object of the assize was to unite the whole people under proper discipline for home defence, and we shall see later how grandly it achieved this object, how complete the union of all classes in the common national cause became, and how eventually this national spirit triumphed over feudalism or tenant service. The Assize of Arms was intended, says Dr. Stubbs, "to create a force for national defence, safer and more trustworthy than the feudal levies." . . . . "Neither the feudal levies which were unmanageable and precarious, nor the mercenaries who were intolerable to the people, were available for the purpose served by the ancient national militia; and that body which was the armed English people, subsisted side by side with the county court and hundred court through the Norman period." In other words, it was already our constitutional force. This it became more than ever in 1285, when Edward I. introduced the provisions of the Assize into the Statute of Winchester. By this act the age of liability to service was fixed at from 16 to 60 years of age. View of armour was to be held twice a year by two constables, and defaults reported through the justices to Parliament and the king. This statute is regarded as "a monument of the persistence of primitive (Saxon) institutions working their way through the substratum of feudalism and gaining strength in the process." Only 10 years later, by the confirmation of charters, and the Act "de Tallagio non concedendo," the right of the Commons to representation in Parliament was likewise conceded, on the famous Justinian principle, that, "as what concerns all should be approved by all, so common dangers should be averted by united efforts."

Thus at last is our constitution complete, and the duties of the people in national defence, as well as their privileges in the national council defined by law. "For," says our historian, "it was the fixed and persistent policy of the kings fully developed under Edward I. to unite the whole people for administrative purposes, whether by eliminating the feudal distinctions or by utilizing them for the general objects of government; that, as the Parliament should be the whole nation in council . . . . the host should be again the whole nation in arms." [1]

[1] Stubbs Hist.

Thus, on the one hand, by one Act of Parliament we have the "Tota communa liberorum hominum"—i.e., the whole body of freemen—obliged to bear arms; on the other, by another Act, the king undertakes not to levy taxes without the consent of the whole community of freemen (communi assensu omnium burgensium et aliorum liberorum hominum.)

There is no bargain. The two Acts are not actually connected, nevertheless, the duties as well as the privileges of citizenship are equally committed to law. Thus nicely balanced in our constitution, as it originally stood, were duty and privilege, the spirit of national service, and the insistence on individual liberty.

Under Henry VII. and the statutes of Livery and Maintenance, the feudal military system was virtually quashed for ever, and when Henry VIII. ascended the throne the ancient Saxon territorial levies, out of which now sprang the trained bands and national militia, were the only constitutional forces available. It was practically the same force which Alfred the Great had inaugurated, based upon the Saxon spirit of national service in defence of king and country before all. Serfdom had disappeared, and the territorial forces of defence now mustered under the sheriffs and officers duly appointed by the king irrespective altogether of feudal tenure, were the English people in arms as a whole, bound by law to train and turn out in defence of their county.

14th CENTURY SCHEMES OF DEFENCE.

I proceed now to review the practical effect of these laws to regulate service upon the evolution of our national scheme for mobilization and defence. The basis of the whole system was, as we have now seen, a thoroughly national spirit of service and training regulated by statute, and affecting all alike. Our ancestors saw nothing degrading in service, without which there cannot be discipline. They recognized it as the first duty of man, and perceived that a man is of value to his fellows, not in proportion as he is free, but in proportion as he renders good service. The "unemployed" alone is absolutely free, because no one requires his services.

The Statute of Winchester was brought into force against rebellion in 1330, and against foreign invasion in 1340. Again, in 1360, when the French attacked and burnt Winchelsea before the local musters could assemble. In each case the whole manhood of the nation was mustered, and thus became gradually educated and accustomed to train and turn out for defence. After the last-named occasion, 1360, Edward III. found fit to compel training on Sundays and holidays, in lieu of certain games which were henceforth forbidden. Richard II. extended such practice by Act of Parliament (1392), even to men employed as servants, whilst Edward IV. enacted that every man should have a bow his own height, and the price of bows was even regulated by law for the national good.

It is in the preparation to resist the invasions threatened in the years 1377 and 1386 that we first begin to see clearly the beginnings of a regular system of mobilization for defence. The strong hand of Edward III. was now removed, and one of those fluctuations of the national spirit was, no doubt, making our enemies fancy they saw an opportunity. But in 1377 we are able to give even the dates of the various steps taken to put the country in a posture of defence. Thus on June 12th the Mayor and bailiffs of Exeter, in view of French invasion, are ordered to repair its walls and ditches, and compel all lay residents within ten leagues to assist, with power to arrest and imprison the disobedient. On June 30th John de Warburton is likewise commissioned to take and get to work stonemasons and others on Corfe Castle, also with power to imprison the disobedient. On July 1st John de Cobham and others and the sheriffs of Kent, and other gentry from practically all counties, are directed to array and keep ever arrayed, the men at arms and archers of their counties to resist invasion, "according to the form of like commissions of the late king." They are likewise to cause beacons to be set up "in the usual places," to give notice of the arrival of the enemy. On July 2nd special Commissions of the Peace are issued, and on July 12th Commission "de Walliis fossatis" are further granted to individuals named for the defence of parts named along the coast, and certain marsh districts such as Ouse and Derwent, Ely in Cambridge, Hythe and Romney in Kent.

Alike in 1377 and 1386 and all the schemes which follow, precautionary measures are clearly distinguishable from actual mobilization. First, the people were mustered and warned, and garrisons and central armies allotted, a post of alarm being assigned to every man. The lighting of the beacons by selected officers, duly appointed, was the calling of the whole manhood of the nation, within reach, to arms—every man to his post—a silent and even more eloquent signal than the single telegraphic word "Mobilize," in common use to-day, and of which Moltke was so proud. Crude the system may have been at first, but it grew more and more complete and regular, the precautionary stages being :—

1. The planning and repair of fortifications.
2. The appointment of commanders to the various sections of coast and the preparation of schemes for local defence.
3. The mustering of all able-bodied men from 16 to 60, and the selection of the more robust for garrison and other permanent duty.
4. The describing of central armies.
5. The preparation of the beacons and guards, and mounted post in connection therewith.
6. The appointment, where necessary, of special Commissioners of the Peace.

The system is a thoroughly decentralized one, organized under the king's lieutenants,[1] the sheriffs, Justices of the Peace, bailiffs, and constables. The inimitable Froissart relates that in 1386, ten thousand men at arms and one hundred thousand archers were mobilized for defence, over and above a large army in Spain. Contingents were also ordered to be sent to London for a central force under the king. "From the Humber to Southampton all the coast of England was well guarded and men upon the watch at every point." He further gives the scheme for defence, namely, to allow the French to land and remain unmolested for several days. The country round them was to be devastated, then their fleet destroyed, and finally the half-starved enemy was to be vigorously assaulted.

TUDOR PERIOD.

(16th Century Schemes of Defence).

Henry VII., having suppressed feudal armies, as we have seen, the Saxon ideal of national militia service triumphed.[2] But civil war had again created a fluctuation of the national spirit. Organization was wanting, and British prestige abroad had fallen very low. Under the influence of Henry VIII.'s early popularity the national spirit of service for defence, however, rapidly revived. Wolsey was his minister for war and organizer: Henry himself was an expert rider, archer, as well as musician and dancer; and under him English archery and training once more regained their renown. It was, however, not till 1539 that his rupture with Rome about his divorce, caused him to anticipate invasion mainly from Germany, at Antwerp, if not from Germany and France combined. So thorough, however, were his preparations that on travelling from Dover to London, the French ambassador reported having seen every subject who could bear arms called up from 17 to 18 without exception. "They are mustering, drilling, and fortifying their exposed frontiers in all directions. . . . . My lord, no invading force could show itself without the whole nation being warned, and every man will be ready to march where danger threatens." The attempted invasion was, in fact, abandoned, and amid great rejoicing, Henry VIII. held upon this very site where we now are, i.e., from his palace at Westminster, called Whitehall, a very remarkable review, when, on May 8th, 1539, 15,000 men of the City of London, clad in white uniform, marched past before him, the Lord Mayor in armour, with a mace by his side, being at their head, and every alderman leading his Guild. Contemporary records remark with pride, "How glad the people were to prepare, what desire they had to do their Prince service! It was a joyful sight to behold of every Englishman."[3] Six years later, in 1545, the French were in

[1] Patent Rolls, Richard II.

[2] Stubbs' Hist., Vol. III, 536. Hume's Hist., Vol. III, 71.

[3] Compare Hall's Chron., Hume Vol. III, p. 312.

turn invading our shores, and this time it is the German Ambassador, Van der Delft, who reports that "by means of beacons the English say that they can anywhere muster 25,000 to 30,000 men in two days, and they are confident in their strength and delighted to see the enemy near." The unanimity and high spirit of national service throughout this period are striking and remarkable. There is a most complete union of all classes in a common cause, and from all sides reports come in that the territorial levies, including even women and children, enter with enthusiasm into the local schemes, taking their coasts and cutting ditches to make the enemy's landing troublesome. Indeed, in 1545, two attempts were made by the French to land, firstly in the Isle of Wight, where the English slowly fell back till, gradually increasing in numbers, they became strong enough to drive the French back to the sea; secondly, at Seaford, where the whole French fleet appeared, and where 300 local territorial archers and others drove 1,500 French who landed back to their ships with the loss of 100 of their number. In all cases the same general principle is followed of central armies supporting the county territorial forces distributed all round the coast; and in 1551 we find a Venetian Ambassador reporting with reference to our coast defence that "great sums of money have of late years been wasted in erecting fortifications which have, however, not answered. . . . . After all, the great security of the kingdom exists in the valour of the nation, where bravery is equalled only by the strict subordination they observe to their respective leaders." The same authority states that the infantry is innumerable. "York alone can muster from seventy to one hundred thousand men capable of bearing arms," and, though we were behind the continent in general use of firearms, Harrison states that our men were waxing skilful in the use of the caliver and pike, it being the duty of the magistrates to see that "the men enrolled practised each one his several weapon." Light troops on the coast falling back on central supports, till met by central armies, is the feature of all local schemes, and the orders for the beacons became even more thorough. Their great aim was (1) to keep an alert watch, (2) to afford to every man a specific post on emergency, (3) to call up on occasion all the men, either of one, or of three, counties, according to the strength of the enemy in view, (4) not to alarm the people falsely and without occasion. To these last two points great attention was given, the number of beacons lit on the coast regulating the area from which the men were to turn out.

Foreign ambassadors, French, German, and Venetian, unite with our own authorities in praise of the high spirit of national service of our people, in view of national danger. "Britain," says one, "has little to apprehend, either from a sudden or deliberate attack, as both would be attended with the greatest risk to the invader."

TUDOR PERIOD CONTINUED.

(The Spanish Armada).

But alike on sea and land, the development of the broadside fire of sailing vessels at sea, and the separation of the three arms on land, had begun already at this time to develop the arts of strategy, tactics, and military organization as we now know them. Foremost amongst our own early strategists stands Drake, who, at the time of the Spanish Armada, had learnt and taught three important lessons:—

1. The superiority of the broadside and swift sailing vessels over the old galley, as an instrument of war.
2. That the strategic position for the British Navy in time of war is off the enemy's ports rather than our own.
3. The value and art of coast defence warfare and of the attack on the land fronts of naval harbours and coast defences.

His policy of destroying the Spanish expedition off its own shores meant the absence of the British Navy from British shores. Strong coast defence became, therefore, a necessity for England, lest, as nearly occurred, the Spanish Navy should elude our own. We are not, therefore, surprised to find Drake, with Sir Walter Raleigh, Sir John Norris, Lord Grey, Sir Thos. Leighton, and others, taking part early in 1588, in a general consultation, the object of which was "to consider a project for the ordering of the forces of the realm to withstand invasion," and the report of this board, together with "the advice of Sir Edward Harwood to Charles I.,"[1] and "the orders to be observed upon any foreign invasion" printed in 1642, form in themselves a complete review of our system of mobilization and defence at this period.

Over and above the general assembly of the whole people on the lighting of the beacons, the total number of men allocated by this Board to garrison of the principal places[2] from the Wash to Falmouth City was 137,000, besides the local forces of Wales and Anglesea. In addition to which there were two Central Armies, each of nearly 30,000, the Army of Tilbury of 19,000 men, sundry forces raised by individuals amounting to 1,000, and an army of the North. The total must have amounted to some 250,000 men, the present strength very nearly of our Territorial Force, at a time when the population of England was but 4½ millions, or only one-tenth of what it is now. Thus a corresponding number of men to-day would be 2,500,000. The local schemes for the defence (for example) of Yorkshire, East Anglia and Kent were carefully and minutely worked out on the same principles as already related, i.e., light troops, mounted

[1] Record Office, Dom Eliz., Vol. 209, 49; and March, 1911 JOURNAL.

[2] Note.—That is, Falmouth, Plymouth, Poole, Portsmouth, Parts of Sussex, Sheppey, Harwich, Parts of Suffolk, Yarmouth.

for choice, patrolling the sea coasts, supported by pioneers, with instructions to fall back upon infantry supports, and take up a position to await the Central Armies. "The whole of the maritime counties," reports a spy and eye-witness, "from Cornwall to Norfolk, were so furnished of men of war, both of themselves and with resort of aid from their next shire, as there was no place to be doubted for landing any foreign forces, but there were within 48 hours come to the place above 20,000 fighting men on horseback, and on foot with field ordinance." To this we may add a Venetian ambassador's report that "the whole island contains a vast multitude of men warlike, resolute, and not only despising but even courting danger." Kent alone was called upon to turn out 18,000 men, and Sussex 17,000 men, the present territorial establishments of these counties being 8,500 and 4,800 respectively, or considerably less than half. Other counties were in like proportion. Thus relatively our forefathers of the 16th century could turn out a force of selected and robust men twenty times as strong as we can, our population being ten times theirs, and our territorial forces only half their strength.

THE REVOLUTIONARY PERIOD.

(Decay of National Spirit. Rise of Standing or Professional Armies, and the New Model).

When the 17th century dawned, in all three great changes were affecting our national defensive system.

1. The musket and the pike had definitely replaced the bow and arrow and bill or lance.
2. The tactical use of the three arms and the ranging of these under separate officers specially qualified, was giving rise to standing armies.
3. England's Navy was being more and more recognized as her first line of defence.

The difficulties of training, in the country, with gunpowder and musket, were, of course, great as compared with the bow and arrow, and combined drill had now reached a degree of importance before unknown. But the professional soldier was never, even in early days, a favourite in this country, and many a pamphlet betrays the strong leaning of old soldiers towards the hereditary system of national training for home defence, more especially as the means of rendering the burden of defence least, and sense of security greatest. Thus the writer of a pamphlet in 1628 shows how advantageous it was "under the old system not to have to draw the people from their counties and proper habitations, except on short notice." Another in 1648 maintains that "the liberty of the people and their safety" is concerned rather in having "the old laws vigorously enforced than in new setting or altering the power of the militia." In short, as the struggle before was between the spirit of national service and the tenant service of feudalism, so now it became between

national service and the spirit of the professional soldier. The advice of the distinguished soldier Sir Edward Harwood, sums up very well the views of those who still held to national service. After giving his opinion that naval service must first be considered, he advises the arming of the whole able-bodied men of the kingdom from 18 or 20 to 35 or 40 years old, and their training under experienced instructors. He recommends that the statutes to regulate service formerly in force be revised and adopted to universal practice with the musket and caliver by shooting at marks; and dwells upon "the advantage to his Majesty by this means of having an army of foot always ready of a sudden, in any part of England to answer all occasions, without drawing his forces much far out of their proper places." Thus does he, too, revert to the primitive Saxon principle of defence, concluding impressively but ominously as follows: "It may be said that these advices will not be found practicable or very difficult. So are all great works at first."

Sir Ed. Harwood was killed in 1632, but ten years afterwards, in 1642, his advice was republished by his brother. In the same year were printed, "The orders meet to be observed for those shires that lie upon the coast," bearing no authority, but manifestly written by a soldier of large experience, who had been as he says, in the Low Countries, where great armies were last assembled, and perused there every regiment—the sorting and division of weapons, as well as their order and description. He dwells upon the necessity of getting men together for training and exercise in sufficient numbers, and proclaims that our aim should be to have our nation well exercised and trained "as the sheet anchor and refuge of all."

But in the very year of the publication of this pamphlet, the Civil War broke out. With it came the "New Model" army of Cromwell, and, later, a standing Army became ever more and more the order of the day.

THE 18th CENTURY.

After the Restoration we find no longer any national scheme for mobilization and defence. When the militia was reconstituted in 1662, it was on a basis of 4 days' regimental training annually, with 2 days' company training 4 times a year. Consequently, in 1690, after our naval defeat at Beachy Head, when a French fleet of 111 sail was riding at anchor in Torbay, the surrounding hills were crowded with a mob of disorganized Englishmen, who were powerless even to prevent 1,000 Frenchmen from burning and sacking Teignmouth. What a contrast to the repulse of the French at the Isle of Wight and Seaford in 1545! Small wonder that in 1698 we find a writer complaining that "the militia as now regulated is burdensome and useless, and successfully rendered an object of the people's contempt and aversion, with a design to create in them a good opinion of mercenaries, and to make them believe a necessity

of always keeping up a standing force of such." Similarly another author in 1712 points out that "a good militia system would be much cheaper than a standing army," though the policy of assenting to the King's inclination to have regular forces after the French model continues, and "must in time be submitted to if we will not look back into what our predecessors thought discretion." Thus in 1740, Carlyle forcibly describes our military affairs as "chaotic, and this in a quite habitual manner this long while back," and describes the English Army as "in a wrong sense the wonder of the world," Finally, in 1756, we had to import 10,000 Hanoverians, and as many Hessians to defend our own shores. Further than this we could not go. In 1757 a Militia Ballot Act was introduced, with company training throughout the summer and autumn twice a month; and, though it appears to have had little effect, we learn from a pamphleteer in 1759 that the militia spirit is gaining ground. Not, however, till the beginning of the 19th century did the spirit of national service rise sufficiently high, even during the Napoleonic wars, to allow of the embodiment of the militia, and after Waterloo the militia became gradually rather a reserve for the regular army than a real national defence force, with an organized scheme for mobilization.

CONCLUSION.

(Modern reversion to Saxon Methods).

Now, at the beginning of the 20th century, the militia as a defence force, has disappeared altogether, and we are, strangely enough reverting, as already indicated, to a territorial force on a county basis, raised almost exactly on the general lines of the Saxons, with modern organization by divisions and defence schemes based on the old national idea of distribution all round the coast of local forces, supported by central armies. So true is it that principles abide, details only change. The only important variation so far to-day is that, whereas our forefathers founded their scheme on manhood service, equitably regulated according to their lights by law, we still adhere to the voluntary principle. The difference clearly is that in the one case you can put your finger on sufficient men at once in any locality threatened. In the other you accept the risk of being found with insufficient organized force to defend England, Ireland and Scotland, as well as our important naval bases, and yet have enough men left for the formation of adequate central armies.

Thus we come back to where we started. Continuity of a high spirit of national service is essential for national security. It is in the fluctuations of it that danger lies, and I have attempted to prove by facts and figures that, estimated by the number of able-bodied men we could put into the field in the 16th century, the spirit of national service of our forefathers in Kent, Sussex, York, London, and other counties was to the spirit of national service of to-day as twenty to one. This is

borne out by Hollingshed's statement that in Elizabeth's time, the musters exceeded a million men, whilst in London, under Henry VIII., 15,000 robust and selected men took part in the interesting review described.

If a high spirit of national service in the 16th century could produce not only such great leaders as Drake, Hawkins, and others, but also Bacon and Shakespeare, ought we not the more to cultivate it? Bacon it was who, centuries ago, warned us that, "sedentary arts and delicate manufactures have in their nature a contrariety to a military disposition." That is the great danger to-day. We have to bridge over the vast gulf which separates the rich from the poor, the duke from the docker. Bacon was 28, Shakespeare 24, at the time of the Armada. Can we do better than remember that the mixture of classes in their day made well disciplined England known also as Merry England, in that century when our first great efforts in literature and the advancement of learning were likewise being made?

In the words of Sir Edward Harwood, these advices may seem not practical or very difficult. Yet I trust that I have not failed altogether to show that a high and universal spirit of national service has an immeasurable strategic value for defence purposes. By this means alone can his Majesty have an army of foot *on a sudden* in any part of his dominions, without drawing his forces much far out of their proper places, and without denuding other parts. The splendid old Anglo-Saxon spirit of manhood service in defence of king and country could effect this. Without it all measures of defence must be relegated to uncertainty, and enlistment become a permanent source of worry and anxiety to those whose duty should be to train recruits, not to procure them. Such absence of national spirit can only be due to educational neglect, that is, to the gross military ignorance of the people. The progress of civilization and of the institutions we value, can only be ensured by the intelligent application of the forces and inventions which civilization herself discovers and produces for her own protection. This can be assured alone at the present day by establishing a national standard of military education and training.

DISCUSSION.

The Chairman: I did not come to the meeting this afternoon to take the Chair, but to say a few words on behalf of the National Service League; and therefore I propose to exercise my privilege as Chairman and open the discussion. I will preface what I am about to say by complimenting the Lecturer on some of his interesting statistics. He commences with the Saxon period, and traces our history of national defence through various periods up to the Militia Act of 1755, then up to the first Volunteer Act of 1794, and so on up to the present time. In treating of the question of national defence, we must speak of the land forces and the sea forces together; we cannot separate the one from the other, because the one is the complement of the other. With regard to the Navy, I do not

think I need say very much about that, because it appears to me that both political parties and all our fellow countrymen, with the exception of a few cranks, are united in their desire to have an all-powerful Navy. I only wish people also considered that an army is absolutely necessary for us, and that they would think in such a way as not to allow the Army to be reduced any more than it is at present.

What, however, both services require is more freedom of action. In the Navy our ships are too much tied to our shores, and although under existing conditions we must always keep a large fleet in home waters because we depend upon our Navy to save us from invasion, we should like to see some of our ships more free than they are at present, to be able to do their duty on the high seas wherever their services may be required. With regard to the Army, recent experience has warned us that our Expeditionary Force may be suddenly called away to help to maintain the balance of power in Europe, and we have no trained men behind them ready to take their place. What, therefore, we really want is a bona fide Territorial Army sufficient in numbers, sufficiently trained, and ready for mobilization at short notice.

That is what the National Service League has been trying to impress upon the country for several years past, believing that such a reserve can only be obtained by a system of compulsory or national training. I think you will agree with me that although our progress has not been what we should wish it to be, still we have made some impression on the country, in spite of the very misleading statements which are often made as to our propaganda. When we first began our movement we only had, I think it was, three Members of Parliament with us. We have now something like 160 who are openly in favour of our proposals, and there are many more sitting on the fence only waiting to see which way the cat jumps to come down on our side. As to the allegations which are brought against us, I saw it stated the other day that we were absolutely in favour of Conscription, pure and simple. I have been connected with the movement ever since it began, and I have never heard any of my colleagues advocate Conscription. Again, it was stated not long ago that we wanted to keep a million men under arms. No one has ever made such a proposal to my knowledge.

What we do urge is this, that we should have a bona-fide Territorial Army of at least 400,000 strong, without counting the lads in their first year of service, and that those men should be ready for mobilization at short notice. I cannot understand any thinking man or any Government, after what has occurred quite recently, being satisfied with the present order of things. Look back at the year 1870 when France suffered her terrible humiliation and found herself under the heavy heel of Germany, and to secure peace had to surrender two Provinces and pay an indemnity of over two hundred million sterling; and, remember, at that time the Navy of France was infinitely superior to that of Germany. The German ships were all shut up in their ports, so that France had all her coasts and communications perfectly clear, and she was not brought to her knees by starvation as we might be under similar circumstances.

I would ask to be allowed to give you one other example as to how a nation suffered a terrible reverse through not being prepared, and one not so generally well known. I refer to the war between Chili and Peru, which broke out in 1879. Peru is a nation which is much better known in England than Chili; it occupies apparently a larger space on

the map, whereas Chili is only a narrow strip of land between the Andes and the sea. At first Peru kept the whole Chilian force at bay with her ironclad ship, the " Huascar," and a few others, but shortly afterwards the Chilians brought their ship, the " Esmeralda " up with their other vessels, and a sea fight took place off the barren coast of Tarapaca. The Peruvian naval forces were worsted, the " Huascar " sunk; and Peru, bereft of her sea power, was absolutely at the mercy of Chili, for Chili had paid attention to her land forces whilst the Peruvians had neglected to do so. Chili invaded Peru, seized Lima, the capital, occupied it for three years, during which time the whole of the people groaned under the tyranny of their oppressors, and in the end Peru was only able to secure the evacuation of the invaders by surrendering to Chili the province of Tarapaca with its rich nitrate fields, which Chili has held ever since and from which she gets millions of revenue every year from the export duty on the nitrate. As far as I remember, Peru only conceded that territory to Chili for, I think it was, ten or twelve years, but Chili still holds it, and apparently intends to keep it.

A few days ago I noted that Lord Haldane, in making a speech, is stated to have said that this country would never accept any sort of compulsory service until England had been invaded not once, but twice. If England is successfully invaded once she will not want it a second time. I suppose the Secretary of State for War meant to imply that any invasion of this country was impossible. You may remember some years ago one of our Statesmen, who is no longer living, is stated to have said that a dinghy could not approach our shores without being discovered and destroyed. Shortly afterwards we were told that we should be prepared against a raid of 10,000 men, later on the 10,000 men were raised to 70,000 men. I suppose the number 70,000 is getting rather awkward even in theory at present, and so I presume, we are coming back again to the dinghy period. When one considers the naval part of the war between Russia and Japan and the number of ships on both sides which were destroyed by mines—the Japanese lost two battleships in as many days—and the submarine boat, which is altogether a new weapon, and which has never been tried in real warfare, and when we remember that in the North Sea and the seas all round our coast the weather is occasionally so thick that you cannot for two or three days together see half a mile beyond the ship, I do maintain, although I admit the invasion bogie is made too much of, that he is a bold man who says at the present time anything is impossible. I have always been brought up to believe that in war it is the impossible that often happens.

In conclusion I would observe that it is uphill work going about the country trying to preach patriotism when some of those who should be the leaders of the people tell them that nothing is necessary, and that they may sleep peacefully in their beds, and also use their best endeavours to dissuade them from making that small self-sacrifice which, in combination with a powerful fleet, would render not only this country, but the whole British Empire, absolutely secure from any interference from outside.

Dr. T. Miller Maguire, M.A., LL.D., said that he would like the Lecturer to make clear one point. Did he mean that there ever had been a period in the history of our race when, without compulsory military service, the State had been able either to enforce its will

on other nations, or to defend itself from serious attacks by other nations? For example, when the Lecturer stated in the last passage of the paper that "a high and universal spirit of national service has an immeasurable strategic value," did that mean a *voluntary* or an *obligatory* national service?

The Lecturer: By national service I mean obligatory universal service, manhood service—the necessity for every man on arriving at manhood to serve in the defence of his country.

Dr. Miller Maguire said that it followed that the present Territorial system was a mockery, and a snare, because it was not based on obligatory military service. One of the arguments with which they were met was, that compulsion was contrary to the spirit of British liberty; that it was antithetical to the grand traditions of Magna Charta, and contrary to the policy of the amorous Henry VIII., or of the dry English Justinian Edward I. But the Lecturer had shown that, instead of obligatory service being antithetical to, it had been contiguous with the spirit of British liberty, and had grown with and cherished the spirit of British liberty throughout.

Colonel E. M. Lloyd said that he had listened with the utmost satisfaction to the long historical statement of the Lecturer, showing how the duty of Englishmen to defend their country had been a recognized part of English common law throughout all the ages. Referring to the mention which Colonel Hickson had made of the remarks by foreign ambassadors on the existence of compulsory service in England, he would like to quote from a little book, "The Complete Captain," written by a Huguenot leader, the Duc de Rohan, in the time of James I. Speaking of the difficulty of recruiting, he said.

> "You must get the best men you can, but in France and Germany beggars cannot be choosers. They have to take what they can get. In England it is very different. They, luckily, by the law of their land, can compel any man to serve; therefore they can pick their soldiers."

How far that was strictly true then may be a question, but at any rate, that was the way in which foreigners looked at it, and that was the way he would be very glad to see them look at it now. He thought the ups and downs to which the Lecturer had referred—the times of high spirit and the times of low spirit—had just corresponded with the urgency of the case; as soon as ever John Bull thought the danger was past he unbuckled his belt and took off his helmet and wanted to go to sleep. But what they had to enforce upon him was that this was not the day when he could afford to do it.

Colonel A. Keene said that by permission of the Chairman he proposed to read a short letter he had received from Lord Roberts with reference to this lecture:

> "I am much obliged to you for sending me a copy of the lecture which Colonel Hickson is to deliver at the R.U.S.I. It is quite excellent. I wish I could be present, but unfortunately I am engaged. I should like to have been able to lay stress on the number of men available for home defence when the population was one-tenth of what it is now, and to express my opinion that there would be equally good results at the present

time if any real attempt were made to put the danger we are in practically before the people, and to rouse their feeling of patriotism instead of minimising the danger and allowing them to believe that 300,000 inefficiently trained men are all that is required to ensure the safety of these islands. Please give my best thanks to Colonel Hickson."

Colonel E. R. Kenyon said that people sometimes told them that the Civil War in America showed that untrained troops would do very well; but remarks of that sort came only from people who had not studied that war. What was it that made Stonewall Jackson's brigade stand like a stone wall in the very first battle except that he alone among all the Generals up to that time had used every minute for training his men.

There was another point to which he desired to refer, namely, the need of mobility. They had got their line of troops, like outposts, stationed all round the kingdom, and they had the central force which was to go and support them, but that central force would be utterly useless unless it was thoroughly mobile. Mobility did not only come from horses, and cycles, and mechanical transport, but it came from training. Therefore they needed not only universal service, but universal training before war broke out, otherwise they would be in the position which seemed to content some people now.

In his opinion they wanted a considerable increase in pack artillery. It would be extremely useful, if ever they had to line Essex, or possibly if they had to go to certain shores abroad, if some of the Territorial Artillery could be turned into pack artillery, which could work up along hedgerows, through ditches, through narrow paths, and so on. Both the mules and the men who would lead them could be trained very much more easily than horses or drivers could be trained for field artillery. They would therefore get a more efficient force at much less expense.

The Lecturer, in reply, thanked Dr. Miller Maguire for having drawn attention to something which might perhaps appear a little ambiguous in his paper. He desired particularly to make himself clear that what he meant by "national service" was service by national law, which implied compulsory service. What they wanted was a law, as of old, to assess equitably the burden of service.

APPENDIX.

REVIEW HELD BY HENRY VIII.

FROM

HIS PALACE AT WESTMINSTER

[WHITEHALL.]

[1] Cardinal Pole in the year 1538 was perambulating Europe with a mission from the Pope, the aim of which was to form a sort of confederacy against Henry VIII., with a view to isolating him, and thus compelling him to make peace with the Church, and atone for past transgressions, as the only condition of retaining his throne. At the same time, David Beton, Abbot of Arbroath, was elected Cardinal, with an express view to his publishing in Scotland the bull of excommunication against the King

[1] Gairdner Letters and Papers, Reign of Henry VIII

of England, and prohibiting all commerce and intelligence, to effect which a special Envoy was further sent to James of Scotland. [1]

Thus at the beginning of 1539, Henry VIII. had serious cause for alarm, which rumours of Italian horsemen in Normandy, and a report that the Duke of Guise was going to Scotland with 20,000 men, did not diminish. Whatever this might portend, the King determined to be prepared for every possible crisis.

A general muster was ordered throughout the Kingdom. All absentee officers from Calais were ordered to return to their posts, and special measures were taken for its defence, as also for the defence of Berwick and other fortified places. Everywhere, and in every way, most energetic preparations were made for defence. Commissioners were appointed to search and defend the coast, which was divided into sections. Norfolk, Suffolk, the Thames, and the coasts of Essex, Kent, Sussex, Southampton, Somerset, Dorset, Devon and Cornwall, Yorkshire, the Castles of Berwick and Carlisle, as well as other strongholds, all had their duly appointed Commanders; whilst plans were drawn up for the construction of bulwarks all round the eastern and southern coast, from the Mount to Dover, and thence to Berwick. Beacons were set in order, and everywhere men were on the watch all round the coasts, whilst the inhabitants of each county were busy at works of defence "Stirred by a belief in universal danger, the people of the island were unanimous in their resolve to defend their country, stake the coast, and cut ditches to make the enemy's landing troublesome." [2] In Essex, even before the arrival of the Commissioners, the inhabitants had already made two trenches, 80 rods in length, and bulwarks, and we learn that "The Earls of Oxford and Essex have taken great pains in the ordering of beacons and other defences. The town of Harwich is much pleased at the King lending them ordnance." [3] "At Harwich ye should have seen women and children work with shovels in the trenches and bulwarks there." All round the coast of Kent very vigilant watch is kept on the Downs and at sea, by Sir Thomas Cheyne, Lord Warden of the Cinque Ports—a wide-awake, but cautious man, who will not needlessly alarm the people. Boats he has out everywhere, but false as well as reliable reports come in. "I have warned them of the Isle," that is Thanet, he says, "to keep sure watch, and bring me word which way they take, when they make sail again," a Dutch fleet having appeared off the Downs. He adds that the men of Thanet "seem marvellous warlike, and I like them none the worse for the cross keys, but I shall light no beacons till I know more. If they land I trust you shall hear of some broken pates, albeit I lack gunners for my great pieces."

Such were the preparations in hand throughout England at a time when Henry VIII., distrusting alike Francis and the Emperor of Germany, —was looking for invasion as certain. [4] The French Ambassador Marillac's arrival and action, and doubtless the reports he submitted stating that "in short they have gone so far that whatever hurt may come they could not be taken unprepared," put an end at last to danger, for he reports that by the end of the summer they will have had time to complete their fortifications everywhere, where an enemy might land. Musters have been made everywhere, and he himself had seen and counted 15,000

[1] Gairdner Letters and Papers, Reign of Henry VIII., Vol. 13, No. 1136.

[2] Vol. 14, Preface page xxxiii.

[3] Vol. 14, No. 682.

[4] Vol. 14, No. 670. Marillac to Montmorency.

Englishmen without any foreigners, 10,000 of whom were armed in white from head to knee, at a muster of the men of London only.

An original report [1] of the review, which King Henry VIII. himself held, of this muster, is contained in the records of the Corporation of London, of which the following summary is taken from the "Grafton Chronicle," printed in 1569.

"The King's Highness, which never ceased to study and take pains both for the advancement of the commonwealth of this his realm of England, of which he was the only supreme governor and head, and also for defence of the same, was lately informed by his trusty and faithful friends that the cankered and cruel serpent the Bishop of Rome, by that arch-traitor Reginald Pole, enemy to God's word and his natural country, had moved and stirred divers great Princes and Potentates of Christendom to invade the realm of England, and utterly destroy the whole nation of the same; wherefore His Majesty in his own person, without any delay took very laborious and painful journeys towards the sea coasts. Also he sent divers of his nobles and counsellors to view and search all the ports and dangers on the coasts, where any meet or convenient landing place might be suffered, as well as the borders of England, as also of Wales. And in all such doubtful places, his Highness caused the Lord Admiral, Earl of Southampton, to prepare in readiness for the sea, to his great cost and charges.

"And beside this, to have all his people in a readiness, he directed his Commissioners throughout the realm to have his people mustered, and the harness and weapons seen and viewed, to the intent that all things should be in readiness if his enemies would make any attempt into this realm: And amongst others, one Commission was directed to the Right Worshipful Sir Thomas Forman, knight, Mayor of London, and his brethren, for to certify all the names of all men between the ages of 60 and 16, and the number of harnesses, weapons, with their kinde and diversities: Whereupon the said Lord Mayor and his brethren every one having with them one of the Counsel or learned men of the City repaired to their Wards, and there by the oath of the Common Counsel and Constables of the same Ward took the number of the men, harnesses and weapons according to their Commissions. And after that they had well viewed their books and the number of persons, they thought it not expedient to admit the whole number of such as were certified for able and apt persons for to muster: Wherefore then they assembled themselves again, and chose out the able persons, and put by the other, and specially all such as had no harness, nor for whom no harness could be provided. But when they were credibly advertised by the King's Counsellor Thomas Lord Cromwell, Knight of the Noble Order of the Garter, Lord Privy Seal (to whose prudence and goodness the City was much bounden) that the King himself would see the people of the City muster in a convenient number, and not to set forth all their power, but to leave some at home to keep the City. Thereat soon every Alderman repaired to his ward, and there put aside all such as had jackes, coats of plute, coat of mail and Briganders, and appointed none but such as had white harness, except such as should bear Moorish pikes, which had no harness but sculles: and they appointed none but such as had white harness, neither did they admit any that was a stranger, although they were denizens. When it was known that the

[1] Vol. 14, No. 940. Archæologia xxxii, 30, from the Records of the Corporation of London.

King would see the muster, Lord how glad the people were to prepare, and what desire they had to do their Prince service, it would have made any faithful subject's heart to have rejoiced. Then every man being of any substance provided himself with a coat of white silk, and garnished their bassenets with turnes like cap of silk set with ouches furnished with chains of gold and feathers: others gilded their harness, their halberds and pollaxes. Some, and especially certain goldsmiths, had their breast plates, yea, and their whole harness of silver bullion. The constables were all in jornets of white silk, with chains, and battle axes. The meaner sort of people were all in coats of white cloth, curiously trimmed with the arms of the city before and behind. The Lord Mayor himself was in fair armour, and the crests thereof were gilt, and over that a coat of black velvet with half sleeves and so was Sir Roger Cholmley, Knight Recorder of London, and all the other Aldermen and Sheriffs, and such as had been Sheriffs, all well mounted on shining horses, richly trapped, with battle axes in their hands, and maces and chains about their necks. The Lord Mayor had four footmen all in white silk."

The account continues relating how the Chamberlain of the City, and the Counsellors and Aldermen's deputies which were appointed to be Wyffelers on horseback, were all in white damask. Four hundred Wyffelers on foot in white silk. The minstrels all in white. The standard bearers were the tallest men of every ward, and when everything was prepared every Alderman mustered his own ward in the fields, viewing every man in his harness, and causing such as could shoot to take bows in their hands, and the others bills or pikes.

"The 8th day of May, according to the King's pleasure, every Alderman in order of battle with his ward came into the common field at Mile-end, and then all the guns served themselves into one place, the pikes in another, and the bowmen in another, and likewise the billmen, and there 'ryuged and snayled,' which was a goodly sight to behold: for all the fields from Whitechapel to Mile End, and from Bethnal Green to Ratclyffe and to Stepney were all covered with harness, men, and weapons, and in especial the battle of pikes seemed to be a great forest. Then every part was divided into three parts, the pikes in three parts and so the other. Then there were appointed three battles, a forward, middle, and rearward.

"About 8 of the clock in the morning marched forward the light pieces of ordnance with stone and powder, after them followed the drums and fifes, and immediately after them a guydon of the arms of the city. Then followed Master Sadler Captain of the gunners, upon a great horse in harness, and a coat of velvet and a chain of gold, and four halberds about him appareled as before is rehearsed. Now followed the gunners four in a rank, every one going five foot assunder, every man's shoulder even with another, which shot altogether in divers places very cheerfully, and especially before the King's Majesty, which at that time sat in his new gate house at his Palace at Westminster, where he viewed all the whole company. In like manner passed the second and third battles, all well and richly appointed. They passed as said, the foremost captain at 9 of the clock in the morning by the little conduit entering into Paul's churchyard, and so directly to Westminster, and so through the Sanctuary and round about the Park of St. James, and so up into the field, and came home through Holborne: and as the first Captain entered again to the little conduit, the last of the muster entered Paul's Churchyard, which then was four of the clock at afternoon. The number was 15,000, beside Whyffelers and other waiters."

EVENTS OF THE MILITARY YEAR 1911, IN THE ARMIES OF FOREIGN POWERS.

FRANCE.

Military Expenditure.—Organization.—Artillery.—Communication Services.—Aeronautics.—Medical.—Education of Officers.—Supply.—Uniform.—Department of Explosives.—Manœuvres and Training.—Colonial Troops.—Military Operations in 1912.

(1) MILITARY EXPENDITURE IN 1911.

The Army Estimates for 1911 amounted to £37,526,469, an increase of £2,640,450 over the expenditure in 1910.

The following is a short analysis of the expenditure:—

Sums voted for.	1910	1911.	Differences.
	£	£	£
Home Service Army	29,764,506	32,432,736	Plus 2.668,230
Colonial Troops in France... ...	1,576,807	1,622,369	Plus 45,562
Special expenditure, new constructions, stores	3,544,706	2,471,330	Minus 73,346
Total	34 886,019	37.526,469	Plus 2,640,446

The military budget of the Colonial Office amounted to an additional £3,390,232, and that sum does not include the cost of the expedition for the relief of Fez, and the occupation of portions of Marocco.

(2) ORGANIZATION.

A number of important reforms have been introduced:—

The High Command and the Superior Council of War have been re-organized by a Presidential Decree.

By this measure the General Officer designated to command the principal group of armies in war, who is now styled the Chief of the General Staff of the Army, is, for the first time brought into touch with the General Staff in peace time, as well as with his own potential staff and subordinates, and is given authority over them and definite functions in connection with them, and with their training.

The same applies to those members of the Superior Council of War designated to command armies in the event of war, who have also been assigned staffs and peace functions in connection with the training of their commands.

The work of the War Office has been redistributed so as to separate preparation for war from routine and administration.

The Superior Council of National Defence has been reorganized by a Decree.

***

A Special Reserve of Officers has been instituted, to which 100 selected officers will be allowed annually to be transferred from the active army, at their own request. The 100 places are distributed, *pro rata*, among the several Arms.

The object of this measure is, partly to remedy the prevailing congestion in the lower ranks, partly to provide a reserve of officers still in their prime, and also to enable a certain number of officers to devote themselves to civil pursuits, while not entirely severing their connection with the army.

Further, 100 officers annually, divided *pro rata* among the several Arms, will in future be allowed to retire on a reduced pension before completing the normal periods of service.

***

In completion of a measure decreed in 1910, by which the pay of the subaltern officers was raised, the pay of the captains of all Arms has, from 1st October, 1911, been similarly raised. A captain in the French Army will now draw pay at the rate of from £145 to £214, according to length of service.

***

Monsieur Messimy has introduced a new system for the posting of recruits. Abuses having crept in, through which favouritism and personal influences have in the past frequently been allowed to determine the units and garrisons to which recruits have been posted, a system has been introduced and came into force in 1911, by which chance alone determines to what units recruits are posted, exceptions being only made where really valid reasons exist for special treatment.

Under the new system lists are made of the recruits destined for each Arm or service, in which all the names are placed in alphabetical order, and every year the letter of the alphabet is drawn by lot; thus if "g" is drawn for 1912 the first recruit among the "g's" goes to the first regiment of his arm, and so on.

***

A number of changes have taken place among the holders of the most important appointments:—

The first six months of 1911 saw no less than four Ministers of War, namely, General Brun, who died in harness, Monsieur Maurice Berteaux, who was killed by an aeroplane, General Goiran, who occasioned the fall of the Monis Government, of which he was a member, by his utterances regarding the High Command, and finally the present energetic and capable Minister, Monsieur Messimy.

In the *Conseil Superieur de la Guerre* General Michel succeeded General Tremeau as Vice-President, and consequently as Commander-in-Chief designate in the event of war, but was relegated to the position of an ordinary member of the Council when the latter body was reorganized later in the year.

General Joffre was then appointed in his place, but with the new title of Chief of the General Staff of the Army, with all the new attributes described above, and General de Castelnau, an officer who enjoys the very highest reputation as a strategist, became First Assistant Chief of the General Staff in peace, and Chief of the Staff designate to the principal group of armies in war.

General Dubail, who had been Chief of the Military Cabinet to Monsieur Berteaux, succeeded General Laffon de Ladebat as Chief of the Staff, and was subsequently continued in the appointment, but with the new functions and with the new title of Chief of the Staff of the Army, when the reorganization described above took place. [1]

The following members of the Superior Council of War retired: Generals Tremeau, Percin and Leon Durand.

The following were appointed members: General S. Meunier, Marion, Laffon de Ladebat and Archinard.

There have been the following changes in the Commanders of Army Corps:—

Ist Army Corps, General Cremer from 2nd Cavalry Division, succeeded General Davignon, retired for age.

IVth Army Corps, General Boelle from 3rd Infantry Division.

VIth Army Corps, General Perruchon, from 40th Infantry Division.

XIVth Army Corps, General Robert retired and was succeeded by General Courbebaisse.

XVth Army Corps, General Mercier Milon, from the Division of Constantine, succeeded General Andry.

XVIth Army Corps, General Faurie, from 6th Infantry Division, succeeded General Courbebaisse, who had himself only succeeded General Marion a few months before.

General Vautier, from an Infantry Division, was appointed to command the Colonial Army Corps in the place of General Archinard.

Major-General Ebener was appointed Commandant of the Staff College vice General Foch, appointed to the 13th Infantry Division.

(3) ARTILLERY.

By a Decree, dated 8th November, 1911, the Establishments and commands of the Artillery are reorganized so as to bring

[1] Since the above was written the office of Chief of the Staff of the Army has been abolished, and General Dubail has been appointed to command the 9th Corps, see February JOURNAL, page 270.

them into harmony with the recent reorganization of that arm, commenced in 1909 and completed, so far as the fighting units are concerned, by the end of 1910.

The objects of the measure were described in the explanatory note of the Minister for War as follows:—

(a) To separate distinctly the establishments whose function it is to assure the provision and maintenance of warlike stores for the Field Army from those charged with the administration and maintenance of the warlike stores required by the Fortified Places.

(b) To render the manufacturing workshops, at present subordinated to the above establishments, independent of them.

(c) To organize the supreme command and the supreme direction of the several establishments so as to place these latter in peace time under the authorities who will control them on mobilization.

The general effect of the measure will be to make the peace formations and Services approximate more closely to the conditions which would prevail in war. The former "Ecoles d'Artillerie" and "Directions d'Artillerie" are abolished and replaced by Field Artillery Parks and Garrison Artillery Parks, the former of which are under the General Commanding the Army Corps Artillery and the latter under the General Commanding the Fortress Group.

(4) COMMUNICATION SERVICES.

Superior Military Railway Committee.

The composition of the Superior Military Railway Committee (*Commission Militaire Supérieure des Chemins de fer*) has been modified as follows:—

President: the Chief of the General Staff.

Vice-Presidents: the Chief of the Staff of the Army and the G.O.C. Lines of Communication designate.

Military Members: the First Assistant Chief of the Staff; the head of the office of Railways and Lines of Communication; a senior officer of Artillery; a senior officer of Railway Troops; a senior officer of the Navy; and the six military representatives on the Boards of the principal railway lines.

Civil Members: the Director of Railways at the office of Public Works; the Inspectors or Chief Engineers of the Mines, or of the Bridges and Highroads Department; and the Technical Commissaries of the six Railway Boards.

Secretary: the Field Officer, Assistant-Chief of the office of Railways and Lines of Communication.

Inspectorate-General of Military Telegraphy.

A General Officer was appointed "to inspect certain units, establishments, and personnel charged with contributing to the execution of the military telegraphic service and also to inspect the personnel placed by the Administration of Posts and Telegraphs at the disposal of the War Department to assure the second-line telegraphic service as well as that of the fortified places."

(5) AERONAUTICS.[1]

The remarkable development of the Military Aeronautic Service has been one of the principal features of the year, especially as regards aviation, and France has greatly increased the long lead she had already obtained last year over the other armies of Europe with respect to the latter branch of aeronautics.

The trend of opinion amongst those who direct the military policy of France, has been to attach ever increasing importance to aviation and less and less to dirigibles. Accordingly, of the original credit taken in 1910 for the provision of dirigibles and their appurtenances, namely, £800,000 to be spread over several years, it seems probable that not more than £560,000 will be devoted to that object.

The sums provided in 1911 were:—

For dirigibles, £200,000.
For aviation, £232,000.

The strength in dirigibles and aeroplanes at the end of 1911 was believed to be as follows:—

Dirigibles, for instructional purposes, the "Colonel Renard," "Liberté," and "Ville-de-Paris."

On the active list:—

The "Capitaine Marshal," stationed at Chalons (Lebaudy 7,500 cubic metres), length 85 metres, 2 motors, Panhard-Levassor of 55 H.P. each or 110 H.P.

The "Adjudant-Vincenot," stationed at Toul (Clement-Bayard 9,000 cubic metres), length 88 metres, 2 motors, Bayard-Clement, of 100 H.P. each, or 200 H.P.

"Le Temps," stationed at St. Cyr (Zodiac, 2,400 cubic metres), length 51 metres, motor, Dansette-Gillet of 70 H.P.

The "Capitaine Feber," Zodiac type.

The "Adjudant-Reau" (Astra) 10,000 cubic metres.

The first of these was presented to the State by Messrs. Lebaudy Brothers, and the third by public subscription.

The following have been ordered but not yet delivered:—

Two dirigible-cruisers, from the Astra works.
Two ditto from Messrs. Lebaudy.
One from Messrs. Clement-Bayard.
Two dirigible-scouts from the Astra works.

[1] A special article on this subject appeared in the February JOURNAL, page 171.—Ed.

These orders are expected to be completed by the end of 1912.

Sheds for dirigibles exist at the four fortresses, Verdun, Toul, Epinal, and Belfort, as well as at St. Cyr, Meudon, Moisson, Issy-les-Moulinaux, Reims, Chalons, and Lamotte-Breuil; some of these are, however, not the property of the State.

The several air-ports are being organized, and equipped with all the necessary plant, including the means of supplying hydrogen.

Of aeroplanes there were believed, at the end of 1911, to be some 150 belonging to Government, of which some 100 are monoplanes, while about 50 can carry a passenger. The number will reach 234 in 1912, including 20 of the improved types evolved by the Reims competition, and which carry two passengers.

Already sections of eight aeroplanes form, in principle, part of the organization of an Army Corps.

There were, at the end of 1911, some 130 officers holding the pilot's certificate of the Aero-club of France, and probably some 200 officers are undergoing instruction. There are also available the whole of the civilian aviators of France, all of whom belong to the Army Reserve.

There are seven centres of military aviation, viz.: Vincennes, Chalons, Douai, St. Cyr, Buc, Etampes and, in Africa, Biskra.

During the year aeroplanes have been employed in collaboration with siege and with field artillery, to locate objectives and to observe fire, and it is claimed that excellent results have been obtained.

Mobile horse-drawn transport has been devised which makes aeroplane sections independent of sheds and parks, and enables them to accompany troops on the march and at all times.

Trials were held at Reims in October and November, in connection with the Government prize of £4,000 (see JOURNAL for May, 1911, page 632), which was offered for the best type of aeroplane which should carry at least 300 kilogrammes, seat two passengers, travel at a rate of at least 60 kilometres per hour, in a continuous flight of 300 kilometres, and which should be adapted for alighting and starting almost anywhere.

Seven types fulfilled these specifications; the aviator Weyman beat all records, on a Nieuport monoplane, which did the 300 kilometres in 2 hours and 23 minutes, or 72 miles per hour.

The exhibits did not present any new features in design, but consisted rather of greatly improved specimens of previously existing types.

A competition of another kind is to take place in 1912 and 1913, for a prize of £6,000 offered by Messrs. Michelin Brothers, with a view to determining "whether the aeroplane is merely an organ of reconnaissance, or whether it is capable of being converted into a terrible engine of war," in other words, whether the idea of dropping bombs from aeroplanes, in order

to destroy arsenals, supply centres or powder factories, or to render impassable bridges, railways or roads, is practicable or not. The competition is to be held under the auspices of the Aero-club of France.

Progress has been made with the scheme for an international aeronautical map, and the Permanent Commission on Aerial Navigation at the Public Works Department has framed conditions for it, founded on the proposals of the Aero-club of France, which is now having the first three sheets prepared as as experiment.

The Staff of the Permanent Inspector-General of Aeronautics was fixed at:—

Chief of the Staff, a Field Officer or Captain.
Three Captains or Lieutenants.
An Administrative Officer of Engineers.

These officers are detached from their corps and classed in the Special Staffs. They are proposed for appointment by the Director of their Arm.

Authority was given for the seconding of officers and non-commissioned officers of all arms, to be attached to the Aeronautic Service as pilots of dirigibles, mechanics of dirigibles. or as aviators, the number to be determined for each year by the Law of Finances. For 1911, this number was fixed at 50 officers and 50 non-commissioned officers.

Regulations were issued governing the bestowal of certificates of various grades, relating to the navigation of aircraft, namely, free balloons, dirigibles and aeroplanes, and for the constitution of the examining Boards and method of procedure of the same.

(6) MEDICAL SERVICES.

New Field Service Regulations for the Army Medical Corps have been issued, but are only to come into force in each Army Corps after the reserves of stores and equipment required for the new sanitary formations have been completed.

An entire reorganization of the Medical Service is being carried out, the former cumbrous Army Corps, Divisional and Brigade Ambulances and Field Hospitals being replaced by a number of smaller, and far handier, interchangeable and self-contained units.

These are of two kinds: the new General Service Ambulances and the new "*Hospitalization* Sections."

Each of the latter consists of everything that is necessary in order to convert one of the former into a miniature field hospital.

The new Ambulances have the following establishment:—

1 Surgeon-Major (mounted), 5 Surgeons (1 mounted), Administrative Officer, 1 supply Officer (mounted), 38 N.C.O.'s and men Army Medical Service, 12 A.S.C. ditto (2 N.C.O.'s

mounted), 19 horses, 1 vehicle for the dismounted personnel, 5 wagons, Medical Service or General Service (2 with Tortoise tents).

A *Hospitalization* Section comprises:—

4 Hospital Orderlies (1 a corporal), 4 A.S.C. (1 N.C.O.), 7 horses, 3 carts.

Each Army Corps will dispose of 4 Ambulances and 3 *Hospitalization* Sections per Division; they will be divided between the first-line transport of the Division, that of the Army Corps and the *Groupe* of Parks.

A new formation, the *Groupe* of stretcher-bearers, forms a link between the regimental medical service and the sanitary formations.

Each Division is to have a Divisional *Groupe* of stretcher-bearers, and each Army Corps an additional *Groupe*.

During an engagement the ambulances allotted to the Divisions take up their positions and receive, by means of the *Groupes* of stretcher-bearers, the wounded who have already received first-aid from the medical officers either of the regiments or of the stretcher-bearers.

After the battle a certain number of the ambulances become stationary in order to ensure the treatment of those cases which cannot be evacuated; these ambulances are completed by the same number of *Hospitalization* Sections.

The immobilized ambulances are immediately replaced in their tactical units by corresponding units from the Army Corps first-line transports, which, in turn, are again completed from the Parks. The same applies to the *Hospitalization* Sections.

On the other hand, as the immobilized ambulances and *Hospitalization* Sections no longer require their wagons and teams, these are sent back to load up a similar number of formations from the Army Reserve, which have been pushed up from the *Gare Regulatrice* to the *Gare de Ravitaillement* or first stage of the Line of Communications. In this manner the *Groupe* of Sanitary Formations of the Parks is reconstituted.

In rear, the Evacuation Hospital continues to fulfil the important functions assigned to it under the old regulations, as regards the control and preparation of the evacuations, but it has been relieved of its obligations as an organ for replenishing the supplies of medical stores.

The Evacuation Hospital disposes of the personnel and materiel necessary for the organization of four improvised Hospital Trains, but these act as "*formations annexes*," and are maintained at the *Gare Regulatrice* pending utilization.

The system of supplying medical requirements of all kinds at the front has been very greatly simplified.

In the 1911 Budget, £122,000 was devoted towards the above reorganization, of which £42,000 was for providing ready-prepared field dressings and other surgical stores.

The establishment of Medical Officers has been considerably increased, and now consists of :—

Surgeon-Inspector-Generals	5
Surgeon-Inspectors	20
Principal Surgeons	145
Surgeon-Majors	950
Assistant-Surgeons	590
Total ...	1710

(7) EDUCATION OF OFFICERS.

A test course of three weeks' duration has been instituted for Colonels having at least 2 years' service in that rank, who aspire to promotion to General.

The practice of classing graduates when they pass out from the Staff College has been discontinued.

In consequence of the institution of the "Centre of advanced military studies" for selected field officers, the rules for the attaching of a certain number of field officers to the Staff College, which came into force in 1906, have been modified, and it has been laid down that, in future, six majors of all arms, who have completed two years' service in that rank, shall be attached to the Staff College with a view to ultimately joining the instructional staff of that establishment. They will be attached nominally for one year only, but they can be kept on indefinitely pending vacancies.

In order to promote uniformity of doctrine in the General Staff, the Staff Officers among whose functions it is to assist the General Officers commanding Army Corps in conducting the instruction of staff officers at the regional centres, are in future to be convoked every second year, for a week's instruction at Headquarters.

Accordingly, one-half of the Chief Staff Officers and Assistant Chief Staff Officers of Army Corps, and the same proportion of the c.s.o.'s of Divisions, both Infantry and Cavalry, were summoned to Paris in two batches to undergo instruction under the supervision of the Chief of the General Staff. The programme included work in the Headquarters Offices, an exercise on the map, and a three days' skeleton manœuvre on the ground.

(8) SUPPLY SERVICE IN THE FIELD.

The following change is made as regards the organization of Supply in the Field :—

In principle the supply wagons of each train of regimental transport are grouped in three sections, designated respectively :—

Distribution Section;
Replenishment Section;
Reserve Section.

Each of the Distribution and Replenishment sections carries one day's rations; the first named section is intended to effect the issues of the day, while the second is employed in filling up.

The Reserve Section comprises the wagons carrying the reserve of rations, the miscellaneous vehicles and spare and led horses.

(9) UNIFORM.

Experiments with new uniforms more closely aproximating to our field service dress, but intended to combine a serviceable and inconspicuous fighting costume with an attractive every-day parade and walking-out uniform, have been continued on a considerable scale, whole units being dressed in the "Mignonette" coloured cloth under trial at some of the autumn manœuvres, with a new helmet of the same colour.

Apparently these patterns were not approved of, and the question is still far from solution.

It has been stated that the celebrated battle painter Monsieur Edouard Detaille and another artist have been asked to submit designs for a suitable dress, which shall be picturesque as well as practical.

(10) DEPARTMENT OF EXPLOSIVES.

An inquiry into the condition and working of the Government gunpowder factories, which was held in consequence of the disastrous explosion which took place on board the warship "Liberté," disclosed a want of efficient supervision which led to some drastic changes in this department.

Several changes of personnel have been made in consequence, and the following measures have been adopted:—

1. More stringent regulations for the various processes of manufacture.
2. Revision of the rules governing the acceptance of powders.
3. Provision of better equipped laboratories for the factories.
4. Checking and testing by the Services employing the powders.
5. Militarization of the engineers and technical agents.
6. Stricter regulations for the supervision and preservation of the stocks of powders, both for land and sea service.

A joint committee on powders has been created at the War Office and Admiralty; it consists of combatant and administrative officers of both Services and of representatives of the Government powder factories. The president is a civilian.

It has been decided to relax the Government monopoly for the manufacture of gunpowders in France, to the extent of

allowing private firms to manufacture powders for exportation only.

(11) MANŒUVRES AND TRAINING.

Manœuvres were held on the same scale as in the preceding years, except that the Army manœuvres which had been projected in the North-East had to be abandoned, owing to cattle disease in that region, and that Corps manœuvres of the VIIth Army Corps (Besançon), were converted into Army manœuvres on a small scale, to take their place.

A new Cavalry Field Exercise has been issued.

Regulations for Cavalry Machine Gun Sections have also been issued. They have been criticised, on the grounds that they do not provide for the separate training, under Brigade arrangements, of these sections, which, in war, are placed under the direct orders of the Brigade Commander.

A circular was issued drawing attention to the increased importance of night operations, owing to the constant improvements in fire-arms, and to the progress made in the utilization of aeronautic means of reconnaissance (aeroplanes and dirigibles), and Army Corps Commanders are directed to ensure that marches of approach, followed by attacks at dawn, are frequently practised throughout training.

A circular was issued warning General Officers commanding Army Corps against the tendency which had manifested itself, especially among Staff College graduates, to make an excessive use of exercises on the map, "an abuse which must lead to indifference and lassitude, and which deprives of any value a means of instruction which, above all, requires that interest shall be maintained all through."

It pointed out that, in regiments, skeleton exercises on the ground form the most practical and efficacious means of instruction because they enable the employment of small units to be studied in all its details.

Some rules were given regulating the frequency and scope of exercises on the map, (1) in regiments, (2) in garrison, (3) at centres of instruction.

(12) COLONIAL FORCES.

The experiment of stationing a Black Battalion from French West Africa, in Algeria, does not appear to have proved a great success so far. According to medical statistics published in the Press, the black troops would seem to have suffered severely from the change of climate, pneumonia having been especially prevalent.

It has, however, been decided to extend the experiment, and to bring a second Black Battalion to Algeria in 1912.

A new battalion, the 9th, is being formed for the 4th Regiment of Tirailleurs Algerians, and will be quartered at Soussa.

The French garrison of the Lake Chad region has been reinforced by the formation of a third battalion, recruited in East Africa, for the 3rd Regiment of Congolese Rifles, which will now number 2,400 men.

(13) MILITARY OPERATIONS.

MAROCCO.—The expedition for the relief of Fez, and the subsequent occupation of portions of Marocco were admirably carried out by General Moinier and the troops, French and African, under his command.[1]

FRENCH EQUATORIAL AFRICA.—Major Hilaire continued during August his operations for the pacification of Wadai. He penetrated the mountainous country of Kodoy in North Wadai, and inflicted a defeat on a mixed force of Kodoys and partisans of Dudmurrah. The latter Chief is since reported to have made his submission to the French Commander.

The Pahuin tribesmen, on the Gabon-Cameroon frontier, attacked a French column in the beginning of September.

GERMANY.

Strength and Establishments.—Military Expenditure.—Organization: *The New Army Bill. Appointments and Promotions.*—Arms and Departments: *Infantry, Cavalry, Artillery, Engineers, Medical.*—Musketry.—Uniform.—Recruiting.—Railways, Telegraphs, and Cables.—Military Operations.—Miscellaneous.

(1) STRENGTH AND ESTABLISHMENTS.

The peace strength of the German Army for the Budget year 1911-12 was:

Infantry	...	...	...	...	411,620
Cavalry	...	...	...	...	74,436
Artillery (a)	...	...	...	...	96,616
Other arms	...	...	...	...	43,830
Total				...	626,502 (b)

(a) The number of field guns was 3,036; it is intended to allot a battalion of 16 heavy guns to each army corps; this will result in an addition of 368 to the number of guns.

(b) This represents an average establishment for which pay can be drawn for the whole year, and not a maximum establishment. In order to obtain a correct total of the peace strength when it is at its maximum in October, about 12,000 one-year volunteers, 2,800 officials and 21,000 extra recruits called up to allow for wastage must be added. This gives a grand total of 662,302.

[1] Details of these operations were given in the Military Notes for June to November, 1911, under the heading "Marocco."—Ed.

The following is an analysis of the peace strength:

Infantry battns	633	Communication troops:—	
Machine-gun batts.	15	Railway battns.	7
Cavalry squadrons	510	Telegraph battns.	5
Horse and field artillery batteries	583	Airship battns.	3
Foot artillery battns.	41	Motor Transport battn.	1
Pioneer battns.	29	Train battns.	23

(2) MILITARY EXPENDITURE.

The following have been the estimates for Military Expenditure during the last 2 years. The amounts actually expended are not published till 3 years later.

Recurrent Ordinary Expenditure:	1910-11.	1911-12.	Difference.
ARMY ADMINISTRATION.	£	£	£
Prussia, Saxony and Württemberg ...	31,472,751	31,640,756	+ 168,005
Bavaria	3,867,530	3,901,771	+ 34,241
Total (a)	35,340,281	35,542,527	+ 202,246
IMPERIAL MILITARY TRIBUNALS			
Prussia, Saxony and Württemberg ...	29,000	25,991	− 3,009
Bavaria	1,456	1,453	− 3
Total (b)	30,456	27,444	− 3,012
GENERAL PENSION FUNDS (c) ...	6,930,077	6,959,212	29,135
ARMY ADMINISTRATION:			
For alterations in the organization of the army in accordance with the new Peace Strength Law.			
Prussia, Saxony and Württemberg	—	165,912	+ 165,912
Bavaria	—	20,459	+ 20,459
Total (d)	—	186,371	+ 186,371
Non-recurrent Ordinary Expenditure:			
ARMY ADMINISTRATION (e)	3,881,800	3,666,411	− 215,389
ARMY ADMINISTRATION (f). In accordance with the new Peace Strength Law	—	208,852	+ 208,852
Extraordinary Expenditure:			
ARMY ADMINISTRATION (g)	1,124,955	1,184,470	+ 59,515
Grand Total (a,b,c,d,e,f,g,)	**47,307,569**	**47,775,287**	**+ 467,718**

NOTE.—The above figures are taken from the *Reichshaushalts-Etat* for the year 1911-12. The figures given for 1910-11 are the sums actually voted. The expenditure on the Protectorate Troops is dealt with in separate estimates and is not included in the preceding table.

(3) ORGANIZATION.

THE NEW ARMY BILL.

This Bill became law on 27th March, 1911. It was decreed that from 1st April, 1911, the peace establishment of the Army was to be increased so as to reach a total of 515,321 by 1915, exclusive of officers, N.C.O.'s over the rank of corporal and one-year volunteers. Of these numbers the Prussian Military States were to contribute 399,026, Bavaria 57,133, Saxony 38,911, and Württemberg 20,251.

The number of units by 31st March, 1915, was to be :—

634 Battalions of Infantry.
510 Squadrons of Cavalry.
592 Batteries of Field Artillery. [1]
49 Battalions of Foot Artillery. [1]
29 Battalions of Pioneers.
17 Battalions of Communication Troops.
23 Battalions of the Train.

The Bill was passed practically in the form in which it was first presented. The only difficulty experienced by the Government was in the matter of the conversion of horse artillery batteries. In this respect the Reichstag demanded that in place of the creation of new field artillery batteries a certain number of horse artillery units should be converted to field artillery.

It is reported that these 18 new batteries are to be armed with field howitzers.

In virtue of the provisions of this Bill the following changes in organization came into force in Prussia during the year under review :—

New Formations.

The following new formations were created :—

1. On 1st April, 1911.

(A) ONE GENERAL INSPECTION OF MILITARY COMMUNICATION SERVICES.—Headquarters : Berlin. Consisting of :—1 General Inspector (with the rank and allowances of a commanding general). 1 Chief of Staff (with the rank and allowances of a regimental commander). 1 General Staff Officer, and 3 Adjutants (majors or captains).

Under the General Inspection of Military Communication Services are placed:—

(a) The Railway Brigade (with the Railway Regiments Nos. 1-3, the Military Railway and the Traffic Sections of the Railway Brigade).

(b) The Field Telegraph Inspection with the 1st and 2nd Inspection of the Telegraph troops (Telegraph Battalion No. 1 including the Cavalry Telegraph School and Telegraph Battalions Nos. 2-4).

[1] Exclusive of batteries at the Schools of Gunnery.

(c) The Inspection of Military Air and Motor Transport Services (with Airship Battalions Nos. 1-3 and the Motor Transport Battalion).

(d) The Experimental Detachment of the Communication Troops and the Experimental Company.

(e) The local Communication officers.

The Inspection of the Communication Troops was abolished.

(B) ONE INSPECTION OF MILITARY AIR AND MOTOR TRANSPORT SERVICES.—Headquarters: Berlin. Consisting of:—1 Inspector (with the rank and allowances of a regimental commander) and 2 Adjutants (lieutenants or 2nd lieutenants).

(C) ONE FOOT ARTILLERY REGIMENT with 2 battalions of 3 batteries each under the designation of "2nd West Prussian Foot Artillery Regiment Nr. 17." This regiment has been allotted to the 2nd Foot Artillery Brigade in the XVIIth Army Corps.

II. On 1st October, 1911.

(D) 82 MACHINE-GUN COMPANIES (see also page 339).—One Instructional Company at the Infantry Musketry School at Spandau.

(E) ONE AIRSHIP BATTALION with airship yard of 2 companies under the designation "Airship Battalion No. 2."

(F) ONE AIRSHIP BATTALION of 2 companies under the designation "Airship Battalion No. 3," including 1 Royal Saxon Detachment, and 1 Royal Württemberg Detachment. The Airship Battalions Nos. 2 and 3 are under the Inspector of Military Air and Motor Transport Services; the former has been allotted to the Guard Corps; the latter to VIIIth Army Corps.

(G) ONE MOTOR TRANSPORT BATTALION of 3 companies, including 1 Royal Saxon and 1 Royal Württemberg Detachment; Headquarters: Berlin. The Motor Transport Battalion is under the Inspector of Military Air and Motor Transport Services, and is allotted to the Guard Corps.

The Hindersin Foot Artillery Regiment No. 2 was reorganized in one regiment of two battalions, each of three batteries, and was allotted to the 1st Foot Artillery Brigade. The headquarters of the 1st Battalion are at Swinemünde, and of the 2nd, composed of the 1st, 6th and 9th batteries, at Emden.[1]

Changes in Establishments.

While the alterations taking effect on the 1st April involved only the creation of some 38 new posts for officers and some 45 N.C.O.'s, those which came into force on the 1st October necessitated more important changes.

[1] Now at Borkum.

REDUCTIONS.—The chief reductions of establishment effected were as follows:—

The 81 Guard and Line Infantry battalions on the higher establishment are reduced by 4 subalterns each; 132 Infantry battalions on the lower establishment were reduced by 20 rank and file each.[1]

The Rifle battalions on the lower establishment (including the Guard "Jäger" and Guard "Schützen" battalions) were each reduced by 2 corporals and 24 rank and file.

The 3rd (Experimental) company of the previously existing "Airship battalion[2]" was abolished.

INCREASES.—The chief increases of establishment were as follows:—

The establishment of the 4th (wireless) companies of the Telegraph battalions was raised by 4 ensigns and 448 other ranks.

OFFICERS.—The establishment of officers in the various arms was *increased* by:

Infantry: 83 captains and 249 subalterns for the new machine gun companies (at the same time 328 posts for subalterns were abolished in consequence of the reduction of establishment mentioned above).

Communication Troops: 3 majors, 11 captains and 26 subalterns for the new Airship battalion and Motor Transport battalion (at the same time the posts of 8 subalterns were abolished).

TRAIN.—The following changes were made in the establishment of the Train:—

In the Guard, No. 3, and No. 17 Battalions, the corporals were increased from 45 to 60, and privates from 115 to 144; in the remainder of the Train battalions the corporals were increased from 45 to 54, and the privates from 114 to 126.

Appointments.

The following were the chief appointments during the year 1911.

Generals von Schlieffen, von Bock u Polach, and v. d. Goltz to the rank of Field Marshal.

Lieut.-General v. Prittelwitz to the command of the XVIth Army Corps, in succession to General v. Woyrsch.

The Crown Prince was appointed to command the 1st Leibhusaren Regiment, stationed at Neufahrwasser, near Danzig.

---

[1] The establishment of these battalions are now considered as "lower," the previous "lower" establishment as "medium."

[2] Now designated No. 1 Airship Battalion.

APPOINTMENT OF TECHNICAL ATTACHES.—Germany has decided to appoint technical Attachés to Embassies and Legations. A commencement is to be made with those in London and Washington. The duties of these Attachés will be to watch technical progress in trade and industry.

(4) ARMS AND DEPARTMENTS.

Infantry.

INFANTRY MACHINE-GUN COMPANIES.—The grand total of 112 machine-gun companies (Prussia 87, Bavaria 12, Saxony 9, Württemberg 4), is to be made up by 1st October, 1915. This total includes 5 machine-gun batteries which are to be converted into companies. The distribution which took place on the 1st October was as follows:—

7 machine-gun companies to the XVIth Army Corps; 66 to the Guard; 3 to the XIVth Army Corps; and 5 each to the IInd, Vth, VIth, VIIth, VIIIth, IXth, and XVIIIth Army Corps.

This makes a total of 52 companies. The remaining 31 are to be divided up among the rest of the Prussian Army Corps. It will be observed that Prussia received nearly its full complement before the end of 1911.

These companies, which are to be numbered the 13th of each regiment, are allotted to a battalion and stand in the same relation to it and to the higher units as the other companies of the battalion.

The officers of the machine-gun companies (including the Instructional Machine-Gun Company) have to provide themselves with horses; they each have forage allowance for 1 horse as well as stable allowance. The officers and men of the machine-gun companies wear the uniform of the unit to which they are attached, with the difference that the sword knots of the men have a light blue acorn, white wreath (*Kranz*), and slider (*Schieber*) and the shoulder straps bear the number "13." The officers and men of the Instructional Machine-Gun Company continue to wear the uniform of the unit to which they belong. The officers of the Instructional Machine-Gun Company receive the following allowances:—

Captains ... ... Marks: 720 (£36) annually.
Lieutenants and 2nd Lieutenants ,, 432 £21 12s.) ,,

In order to provide officers of the Reserve for duty with machine-gun companies it was decided to admit 4 one-year volunteers for service with each company, commencing in October; these men can be transferred to the Infantry if found unsuitable for the work.

Cavalry.

SCHOOLS OF MILITARY EQUITATION.—It has long been intended to increase the number of schools of Military Equita-

tion; the addition of three schools is contemplated, one of which will probably be instituted during the present year.

The headquarters of the 3rd Cavalry Inspection were moved from Munster to Strassburg.

Artillery.

NEW REGULATIONS.—New Firing Regulations for the Field Artillery were issued in March.

HOWITZERS.—It was stated in the Press at the end of the year that considerable additions are to be made to the heavy artillery of the field army in the shape of 15 cm. howitzers.

Engineers.

TELEGRAPH BATTALIONS.—For the first time two-year volunteers were detailed this year for duty with the Telegraph Battalion at Frankfort in connection with wireless telegraphy.

MEANS OF LIGHTING UP GROUND AT NIGHT.—Pistols for throwing either a sort of star shell for signalling or lighting up ground at night are now to be issued as an article of equipment to Pioneer battalions. They have formed the subject of experiment for some time past.

Medical Services.

SHORTAGE OF MEDICAL OFFICERS.—There was considerable discussion during the year under review, both in the Press and in the Reichstag, over the shortage of medical officers. It was stated that the shortage in the field ambulance amounted to 49.8 per cent.

It was decreed in an Army Order, dated 31st May, 1911, that the Medical Inspectors were in future to bear the title of "Obergeneralarzt."

Motor Vehicles.

MOTOR TRACTION.—Motor traction trials with a new type of military wagon took place in November. The wagons started from Brunswick on November 10th, and arrived in Berlin on December 6th. The length of the journey was 2,000 kilometres (1,250 miles) The German authorities have decided to subsidize tank-vehicles for the transport of petrol; the necessary conditions being absolute safety in use, security from danger of fire and explosion, and the easy and convenient method of supply to motor vehicles, etc.

The number of subsidized motor vehicles at the end of 1911 was 655, at a cost of £165,000.

The total sum allotted to motor transport services in the Estimates for 1911 was at least 2,095,000 M. (£104,750).

The Government offered two prizes for a type of motor bicycle suitable for military purposes. The competing machines were tested during the manœuvres in the autumn.

(5) MUSKETRY COURSES.

COURSES.—The following musketry courses were held during the year:—

(a) Two "Information courses" of 10 days each for regimental commanders, staff officers, and cavalry field officers, and one of 10 days for regimental commanders or lieutenant-colonels of dismounted troops (excluding field artillery).

(b) Four "instructional courses" of three weeks for captains or lieutenants.

(c) One machine-gun course for battalion commanders who have machine-gun companies under their command, and who have not yet been through a course of this kind.

(d) Five "exercise courses" of six weeks each for young officers and non-commissioned officers of infantry and rifles.

Four similar courses for non-commissioned officers of cavalry.

(6) UNIFORM AND EQUIPMENT.

BADGES OF RANK.—An Army Order dated 12th January, 1911, decreed that Field Marshals should in future wear four stars on the epaulette or shoulder strap.

Officers are permitted to wear the existing pattern of helmet until the end of 1912. Existing stores in the possession of the troops are to be used up.

EQUIPMENT OF CYCLISTS.—Instructions were issued in Army Orders of the 29th December, 1911, that the uniform and equipment of cyclists is to be the same as that of the men of the units to which they belong, with a few exceptions, which are indicated. Every cyclist is to be furnished with the following —(1) a waterproof cloak of grey material; (2) a map case; (3) a holdall with carrying strap.

NEW OFFICER'S KNAPSACK.—The decision as to the prize for the best design of a pack to be worn by officers was announced on 17th December last, to the effect that the first prize could not be awarded as none of the inventions submitted fulfilled all the conditions. The 2nd and 3rd prizes were distributed. The authorities have now issued an experimental knapsack of a similar colour to that worn by the rank and file, except that at a short distance an officer can be recognized by the fact that there are brown straps on the pack.

The 6th Cuirassiers have had the distinction conferred on them of being allowed to wear the cypher of their august chief, His Majesty, King George Vth.

FIELD-GREY.—Regimental tents are in future to be made of "field-grey" material, in place of the grey brown formerly used.

(7) RECRUITING.

RECRUITING STATISTICS FOR 1910.—The figures given below were officially published in October, 1911.

The total on the recruiting list in 1910 was 1,245,363, which is an increase of 18,633 on the figures of the preceding year, which amounted to 1,226,730.

The following table shows the classification of the numbers given above into the various categories :—

Numbers excluded from military service ...	890
Numbers physically unfit	34,067
Numbers posted to the *Landsturm*	144,737
Numbers posted to the *Ersatz* reserve ...	80,262
Total (a)	259,956
Contingent taken for the standing army—	
Service with arms	201,530
Service without arms	2,623
Total (b)	204,153
Volunteers and men enlisted for special purposes (c) ...	37,673
Total for the Standing Army (b) and (c) ...	241,826
Numbers posted to the Naval *Ersatz* reserve ...	2,660
Contingent taken for the Navy	12,156
Volunteers for the Navy	2,287
Total for the Navy (d) ...	17,103
Number of men whose service was postponed, emigrants and excess numbers (e) ...	726,478
Total (a), (b), (c), (d), and (e)	1,245,363

In addition to the above the following enlisted as volunteers before reaching the military age (20) :—

In the standing army—	
[1] One-year volunteers	1,749
Other volunteers	24,636
Schoolmasters specially enlisted	19
In the Navy	2,782
Total ...	29,186

The contingent taken compulsorily for the Army and Navy was made up as follows :—

Men of 20 years of age	101,215
Men of 21 years of age	53,228
Men of 22 years of age	60,071
Men above 22 years of age	1,795
Total ...	216,309

[1] The total number of one-year volunteers for the Army in 1910 was 13,145. In 1909, 12,383.

It will be observed that the numbers distributed among the various categories do not differ very materially. There is a slight decrease in the contingent taken compulsorily for the Army in 1910, which may be chiefly accounted for by an increase in the number of volunteers. The contingent taken for the Navy is, however, larger in 1910 than in 1909.

In 1910 the number posted to the *Landsturm* is larger, and the number posted to the *Ersatz* reserve smaller than in the preceding year.

Of the number taken compulsorily for the Army and Navy, 137,033 were born in the country and 79,276 in the towns.

(8) RAILWAYS, TELEGRAPHS AND CABLES.

RAILWAYS.—In German East Africa the Dar-es-Salaam—Tabora railway has reached the latter town, two and a half years before the date originally fixed. The extension of this railway to Lake Tanganyika was considered by the Reichstag in November and is likely to be sanctioned; survey work on the proposed extension has commenced. The Usambara railway in the north of the Protectorate was opened for traffic up to Moschi on October 4th, and will probably be extended for at least 50 miles.

In South-West Africa, the alteration of the Karibib—Windhuk railway from narrow to normal (or "Cape") gauge was completed in September; the Karibib—Keetmanshoop, or North-South railway has been completed.

In the Cameroons, the Manenguba railway was opened to traffic in April; this line starts from Bonaberi opposite Duala, and after running through mangrove swamps and jungle, terminates at Nkongsamba, 100 miles from Bonaberi; it opens up a district suitable for the cultivation of cotton, tobacco, rice, etc. Good progress has been made with the Central or Duala—Edea railway.

WIRELESS TELEGRAPHY (GENERAL).—The Marconi Wireless Telegraph Company entered into an agreement with 4 of the German companies in January, by which the interests of all 5 companies in wireless telegraphy for the German mercantile marine are transferred to a new company, the "Deutsche-Betriebs-Gt für Drahtlose Telegraphie." It is stated that by this agreement the conflict hitherto existing between the Marconi and Telefunken interests will come to an end. A wireless station has been erected at Swinemünde. This station corresponds in the Baltic to Norddeich in the North Sea. It has a radius of action of 500 kilometres (312 miles about).

STATION AT NAUEN.—The Telefunken company has rebuilt a station at Nauen with the highest tower in the world, after the Eiffel Tower. The station already had a range of 5,000 kilometres, and far better results are expected with the new tower.

The Bukoba and Mwanza wireless stations in German East Africa were in full working order in March, 1911. The radius of the former is 200 kilometres (125 miles), and of the latter 600 kilometres (375 miles). They are each worked by 28 horse-power motors, and the height of the Bukoba mast is 60 metres (200 feet), and that of the Mwanza mast is 85 metres (280 feet). A powerful station is to be established at Tabora, with a radius of 2,500 miles. The object of this will be to link up German East Africa with stations to be established in the Cameroons, and probably also in German South-West Africa.

Wireless telegraph stations are reported to have been or are about to be established at Swakopmund and Lüderitzbucht. Their radius of action is to be sufficient to enable them to communicate, not only with each other, but also with a station to be erected at Duala in the Cameroons.

KIAOCHAO.—The wireless station has been improved and enlarged and now has a radius of about 400 miles. £7,500 have been spent on this work.

GERMAN CABLE TO BRAZIL.—Telegraphic communication between Germany and Brazil by the cable extension Emden—Teneriffe—Monrovia—Pernambuco became available to the public on March 29th. The cable, which is 10,740 kilometres (6,712 miles) long, is German throughout.

(9) MILITARY OPERATIONS.

GERMAN EAST AFRICA.—Some unrest was reported from the district of Urundi, on the N.E. banks of Lake Tanganyika, and a small column was organized to punish the unruly tribes, who had been looting caravans and murdering traders.

There was some slight trouble in the North of the colony in September, chiefly due to raids from Masai tribes on the frontier with British East Africa. A small column was despatched to deal with the raiders.

CAMEROONS.—An expedition against the Bapea tribe was brought to a rapid and successful issue during the month of March.

WESTERN PACIFIC. THE RISING IN PONAPE.—The punitive measures undertaken to avenge the murder of German officials in Ponape were brought to a close in February. The operations were successful and resulted in the complete surrender of the rebellious tribes. Some 15 natives who were found guilty of complicity in the murders have been shot, and the remaining prisoners, 426 in number, have been banished to a neighbouring island. Almost all the rifles belonging to the natives are said to have been handed over. From further particulars which have been published in the Press it appears that the rising in Ponape in October, 1910, was due to the dislike of the natives to forced labour. Some officials were murdered, and the

remaining Europeans were for some time besieged in the settlement. In January a combined naval and police punitive force was despatched against the rebels. A naval force, which was landed on January 26th, stormed the rebel position, losing one officer and 3 men killed. On February 14th it was reported that 26 of the ringleaders had surrendered.

(10) MISCELLANEOUS.

TROOP TRAINS.—Provisional regulations have been issued on the subject of troop trains taking priority over other traffic in peace as well as in war.

ALSACE LORRAINE BILL.—The Bill granting a constitution to Alsace Lorraine was finally passed by the Reichstag at the end of May. The main provisions are as follows:—

Alsace Lorraine has three votes in the Federal Council, subject to certain limitations. The head of the Government of the Reichsland is a "Statthalter" who is appointed by the Emperor. There are two Chambers, and every law must be assented to by the Emperor and these two Chambers. The members elected to the Reichstag will continue to be elected.

THE CENSUS.—According to official but provisional returns of the Census of the German Empire, taken on December 1st, 1910, the population reached a total of 64,896,881—an increase of 4,255,392 in the last five years, The population of Prussia is provisionally returned at 40,156,791. This census registers a lower birth rate in 1910 than any for 60 years, the number of births being just below 2 millions for the first time in 24 years. Since 1908 the decrease has been 94,000.

GERMANY'S FOREIGN TRADE IN 1910.—In 1910 the value of imports without reckoning gold and silver was 8,609,200,000 Marks, and exports 7,467,100,000 Marks. In the previous year the figures were 8,526,922,000 and 6,594,354,000 respectively.

FINANCE.—The final accounts of the Imperial Central Treasury for the financial year of 1910, show a surplus of £5,885,000. Customs and taxes yielded an increase of £2,875,000, while the profits of the Imperial Posts and Railways showed increases of £985,000 and £590,000 respectively.

MESSRS. KRUPP'S WORKS.—It appears from the annual report and balance sheet of this firm, which was issued in December, that, inclusive of a sum of 163,929 Marks[1] (£8,196) transferred from last year's account, several other subsidiary receipts of 2,517,586 M. (£115,879) and dividends from invested stock, and after deductions amounting to 19,508,491 M. (£975,424) have been taken into account, a total balance is shown of 43,264,961 M. (£2,163,248).

Against this must be set taxes amounting to 3,736,850 M. (£186,842), compulsory workmen's insurance to 4,223,676 M.

[1] 20 Marks have been taken to be equivalent to £1 sterling.

(£211,183), and expenses for the general welfare to 6,423,240 M. (£381,183).

Thus there remains, exclusive of the balance carried forward from 1909-10, a *net profit* of 28,712,264 M. (£1,435,613), which, with last year's balance amounts to 28,876,193 M. (£1,443,809).

Out of this net profit 5 per cent., *i.e.*, 1,435,613 M. (£71,280) are first of all to be transferred to the statutory Reserve fund, and then a dividend of 10 per cent., 18,000,000 M. (£900,000) is to be paid; 2,000,000 M. (£100,000) is to be allotted to the Special Reserve Fund, 1,000,000 M. (£50,000) to the Officials Pension Fund, and 2,000,000 M. (£100,000) to the Security Account. In addition to the above, 210,000 M. (£10,500) are to be paid as salaries to the Board of Directors, and 4,230,520 M. (£211,529) is to be carried forward to next year's account. The net profit has risen in the year under review by nearly 7½ million M. (£375,000), or by over a third more than last year.

This is a record in the financial achievements of the firm, as is shown by the following table:—

	Net Profit.		*Dividend Paid.*
1903-04	M.11,562,762	(£ 578,138)	6½ per cent.
1904-05	M.16,413,040	(£ 820,652)	7½ ,, ,,
1905-06	M.20,738,095	(£1,036,904)	10 ,, ,,
1906-07	M.24,844,266	(£1,242,213)	10 ,, ,,
1907-08	M.18,488,170	(£ 924,408)	8 ,, ,,
1908-09	M.15,607,624	(£ 780,381)	8 ,, ,,
1909-10	M.21,265,307	(£1,063,307)	10 ,, ,,
1910-11	M.28,712,264	(£1,435,613)	10 ,, ,,

Since 1906 the capital of the company has been raised from 160 to 180 million M. (£8 million to £9 million). The existing profits, as stated above, are not to be employed in increasing the dividends, but for the purpose of improving the financial position of the firm.

The value of the real estate on the 30th June, 1911, amounted to 207,871,971 M. (£10,393,598), and, after the necessary deductions had been made, was given in the balance sheet as being worth 188,363,479 M. (£9,418,173).

The plant and transport arrangements are valued at 9,877,779 M. (£493,888), and the half finished and completed goods at 160,771,697 M. (£8,038,584). The cash in the safe, change and balance in the bank amount together to 56,116,454 M. (£2,805,824).

It is evident from the preceding figures that the present financial position of the firm is an eminently sound one.

Early in 1911, Messrs. Krupp's obtained the controlling influence in the management of the Westphalian Wire Manufacturing Company, one of the principal iron and steel firms in Germany.

APPENDIX.

GROWTH OF EXPENDITURE AND PEACE ESTABLISHMENTS IN GERMANY.

Peace Establishments.—The following figures show the growth in the peace establishments:—

	Officers.	Rank and File.		Officers.	Rank and File.
1875	21,744	402,311	1904	32,807	578,679
1881	23,218	428,023	1905	33,109	581,285
1888	25,520	469,305	1906	33,423	585,677
1892	27,727	487,931	1907	33,947	587,723
1894	27,955	558,255	1908	34,462	589,513
1898	31,212	558,541	1909	34,592	591,550
1900	32,180	572,806	1910	34,850	592,665
1902	32,722	577,589			

Expenditure.—The constant growth of military expenditure is shown by the Budget figures for the following typical years:—

1872	... ...	£16,750,341	1899-'00	... ...	£32,236,000
1895-6	... ...	27,526,000	1900-'01	... ...	33,427,000
1896-7	.. ...	28,292,000	1909-'10	... ...	49,427,733
1897-8	... ...	29,549,000	1910-'11	... ...	47,307,569
1898-9	... ...	30,405,000	1911-'12	... ...	47,775,287

The total increase of expenditure is thus some thirty millions since the founding of the Empire. This increase is not entirely due to the increase in establishments, as will be seen from the following table:—

Expenditure per Man.—Average expenditure per man in Germany during the years 1875 to 1910.

Year.	£ s. d.	Year.	£ s. d.
1875	40 17 0	1904	50 12 0
1881	42 5 0	1905	50 4 0
1888	41 15 0	1906	51 14 0
1892	46 10 0	1907	53 9 0
1894	43 12 0	1908	55 18 0
1898	46 9 0	1909	55 15 0
1900	47 16 0	1910	58 9 0
1902	49 16 0		

Effective Strength and Expenditure.—Comparing the effective strength (i.e., the peace establishment less absentees, men on leave, etc.) and the expenditure for 1875 and 1908, we find that there was an increase of effective strength in 1908 of 58.8 per cent. officers, and 58.2 per cent. rank and file, while the ordinary expenditure had increased by 115.2 per cent. A similar comparison for 1894 and 1908 shows an increase in the latter year of 23.4 per cent. officers and 9.3 per cent. rank and file, in conjunction with an increase of ordinary expenditure of 39 per cent.

If the one-year volunteers and military employees be added to the above the total will be 607,765.

Cost of Maintenance per Head.—The annual cost of pay, food, clothing, and quarters of a Prussian soldier have risen as follows:—

	Cost per head. £ s. d.
1750	5 12 0
1800	5 19 0
1850	8 13 0
1907	19 11 2

The last total was made up as follows:—

	£ s. d.
Pay	3 19 2
Food	9 16 0
*Clothing and equipment (not arms)	3 4 0
Quarters	2 12 0
Total	£19 11 2

According to figures given in the 1910 Budget, the charge for food had risen to £10 7s. 4d. per man, viz.—

	£ s. d.
Bread and Supply Reserve	3 0 1½
Ordinary food supply of the rank and file ...	7 7 2½
Total	£10 7 4

While the charge for clothing was stated* in February, 1911, to be £3 11s. 0d.

Assuming that the charges for pay and quarters are the same as in 1907, this brings the annual cost of maintenance of a Prussian soldier to £20 9s. 6d. per head in 1911.

* See JOURNAL for April, 1911, page 552.

INFANTRY IN BATTLE.

By Lieut.-Colonel J. Campbell, d.s.o., Q.O. Cameron Highlanders, Chief Instructor, School of Musketry.

On Wednesday, February 21st, 1912.

Brig.-General F. I. Maxse, c.b., d.s.o., in the Chair.

The following note was circulated before the delivery of Colonel Campbell's lecture to a number of battalions in the Eastern and Aldershot Commands.

This lecture is based upon Infantry Training, Part IV., "Infantry in Battle," and there will be a discussion after the lecture, in which it is hoped company officers will take part.

In fact, one of the main objects of this particular lecture is to afford officers who are engaged in training men an opportunity of discussing any points upon which they may be doubtful, or have experienced difficulty in dealing with. They will thus hear the views of other officers, and suggestions which may be useful will be made.

Lieutenant-Colonel Campbell will touch upon various main points in his lecture, but there are various matters of detail which may well be raised by any company officer who attends.

To facilitate discussion, the following points, which have been found by experience to present difficulties, are suggested as being worthy of elucidation. These points are not dealt with fully in the lecture, but arise from what will be said.

It is hoped that many other points will suggest themselves to officers for discussion after the lecture, and the Chairman hopes that company officers will not hesitate to raise questions.

A copy of the lecture will be sent to each battalion before hand to enable officers to think it over.

Points for Discussion.

1. Maintenance of communication between companies and with the Commanding Officer by company commanders in the attack. The means at the disposal of company commanders for this purpose and how they should be employed?

2. The position and duties of the subalterns in the attack. How should one subaltern be employed, in the absence of a second subaltern?

3. The position and duties of the colour-sergeant in the attack?

4. Should range takers be with the company commander, or with the firing line, in the attack?

5. How can we best practise the supply of ammunition in the attack in peace time?

6. What is the best method of re-organizing sections (or any fire unit) during the inevitable disorder which arises in the later stages of the attack?

7. Methods of controlling fire in the attack, now that the whistle for the "Cease-fire" has been abolished?

8. Infantry Training, Section 122, Para. 4, bottom of page 105. Is this clear?

9. Infantry Training, Section 125. Para. 4, top of page 112. Is it understood how these zones of unaimed fire are created so far in rear of the firing line?

LECTURE.

THE title of my lecture, INFANTRY IN BATTLE, implies far more than the lecture contains, for it is quite elementary. The title has been selected for two reasons, first to connect what I propose to say with the clear treatment of the subject contained in Part IV. of Infantry Training, and in the second place, to keep before us the very important fundamental principle that all our training in peace should be carried out with the sole object of preparing ourselves to meet and defeat an enemy in war.

This general heading will also remind us of another fundamental principle, which is not always realized in practice, namely that the action of troops on the battlefield, whether connected with fire or movement, is included in the term Tactics.

One of the objects of training is to teach leaders, *i.e.*, officers and N.C.O.'s, to handle their men intelligently on service, both as regards fire and movement, whatever the situation may be. In order to do this they should learn by constant practice and study to apply instinctively the principles which are laid down in our Training Manuals.

It is frequently asked why these Manuals do not suggest more definitely how the principles they enunciate should be applied. The reason is that the application of principles varies with certain factors which present themselves in war, many of which cannot be reproduced in peace. For example, much will depend on the characteristics and armament of the enemy, *i.e.*, his temperament and method of fighting, for instance, the Boers compared with a European Power. Again, there is the degree of training and the physical condition of troops. These vary during a campaign; the former as reservists or recruits are drafted into the ranks to replace casualties; the latter according to the fatigue and privations the men have been called upon to endure, or the severity of the engagements in which they have taken part.

There is also the nature of the country over which fighting may take place, which has a very important bearing on the application of tactical principles; the same methods could

not be followed in the Soudan as on the N.W. frontier of India, although the principles remain the same.

It is therefore clear that definite rules as to the application of tactical principles cannot be laid down, and that the only way to deal with the situations of war is by obtaining a thorough knowledge of principles by study, and by learning to apply those principles by practice and the use of common sense, under the most varying conditions that can be obtained.

An article by General Haking entitled "Company Training," in the last number of the *Army Review*, shows very clearly how leaders should learn and how they should teach others to apply principles.

The secret of leadership lies in knowledge of and judgment in applying correctly the principles of Tactics under varying conditions.

Some of the responsibilities which devolve upon individuals on the battlefield will now be considered under the four headings:—

1. Fire Organization.
2. Fire Direction.
3. Fire Control.
4. Fire Discipline.

1. Fire Organization.

Among the duties of higher commanders is included that of Fire Organization, which requires a preliminary reconnaissance to enable a commander to issue definite orders regarding frontages and objectives, and to ensure co-operation of fire, either to assist movement in the attack or to check the advance of the enemy towards a defended position, as the case may be. This includes the provision of supporting fire by artillery, machine guns and specially detailed bodies of infantry, as well as a system of communication for the transmission of orders and information.

It is by means of such previous organization that a commander is enabled to make his influence felt, and, by thus ensuring co-operation throughout his force, will beneficially affect the course of the battle.

We now come to the *Responsibilities of Subordinate Commanders*, which term includes company commanders, company officers, section and squad commanders, and the machine-gun section commander.

Their respective positions in action should be where they can most effectively exercise supervision over their men, watch the enemy, and receive and transmit orders.

Thus a company commander in the attack should not generally be with the firing line of his company until the supports have been absorbed into it. He should place himself where he can supervise the whole company, for he must use judgment in handling his supports. This is a very important duty because

a great deal depends upon reinforcements reaching the firing line at the right moment and in the right place.

In defence, the company commander may often with advantage be with the firing line, because, since there is generally no question of movement, he will be able to watch the progress of the action, and thus be in the best position to use his supports to advantage.

His other duties will include, ordering the first opening of fire in accordance with such instructions as he may have received from his superior commander, or, in the absence of such instructions, using his own judgment regarding the opening of fire, as to which he should be guided by the principles indicated in Infantry Training.

He should watch the action of neighbouring troops, so as to be prepared to assist them by his fire when required.

He must ensure that the firing line is kept supplied with ammunition and that communication is maintained with neighbouring troops, as well as with his own commanding officer, to whom he should send information from time to time as to the course of events.

2. Fire Direction.

When in a suitable position and the situation admits, the company commander should direct fire, *i.e.*, he should indicate the target or targets to be engaged, decide whether fire should be concentrated or distributed, give the sighting elevation to be used, and regulate the volume of fire required by the tactical situation.

As already mentioned the company commander will not always be in such a position during the attack as will enable him to issue fire direction orders, in which case this duty of fire direction will devolve upon the company officer or N.C.O. commanding in the firing line.

Any officer or N.C.O. who has more than one fire unit under his command may be required by the tactical situation to give fire direction orders, in accordance with which the fire unit commanders give the executive orders for firing.

Thus an officer or N.C.O. who gives the executive order to fire is for the time being a fire unit commander, and the men to whom the order is given constitute a fire unit. For example, if a section commander decides to concentrate the fire of his section he may give the executive order on which fire is opened; he thus becomes a fire unit commander, and his section a fire unit. He may then, perhaps, order each squad to concentrate its fire upon a different target, which he indicates. The section commander in this case gives fire direction orders and each squad becomes a fire unit, and each squad commander a fire unit commander.

It is therefore apparent that, under varying conditions, the company, half company, section or squad may at any time

become temporarily a fire unit, during a particular phase of an action.

3. Fire Control.

This brings us to a consideration of Fire Control, which means the duty of fire unit commanders to give the executive orders for firing in accordance with fire direction orders. In the course of an action, for various reasons, fire direction may be no longer possible, and it then becomes the duty of fire unit commanders to act upon their own initiative and judgment, and to include in their fire orders whatever may be necessary to ensure that the fire of their men will be effective.

Having now considered some of the responsibilities of subordinate commanders, we come to the *Private Soldier*. There is sometimes a tendency to underrate the importance of his responsibilities, but it must be remembered that he is the man who actually fires the rifle, and, however skilful his commander may be in giving fire orders, his skill will be useless unless the steadiness and reliability of the private soldier can be thoroughly depended on.

4. Fire Discipline.

Fire Discipline is the particular branch of training which develops these qualities in the private soldier. It requires implicit obedience, under all circumstances, to the fire orders he has received, and, in the absence of orders, ability to carry on the fire fight on his own initiative and judgment. This means a cool and intelligent use of his rifle.

At this point it may be useful to consider one or two questions connected with peace training which arise from what has already been said.

The first is the *Supply of Ammunition* in the attack. Infantry Training deals fully and clearly with this important question, but unfortunately, if neglected, no obvious penalty is incurred in peace operations; yet, if overlooked in war, the result may be disastrous. Under modern conditions the supply of ammunition during the attack is an exceedingly difficult problem, but it must be faced and overcome by constant practice in peace. The essential point is that men in the firing line should have an ample supply of ammunition when the critical period of the battle is reached, *i.e.*, at close range. Before this critical period men should be given as much as they can carry without impairing their mobility.

Two of the practical difficulties which are sure to arise on service owing to insufficient training, may be mentioned here.

Probably the N.C.O. placed in charge of the company pack animal will either keep it so far back as to delay the supply of ammunition to units going forward to reinforce the firing line, or so far forward that the animal will be shot. He will either have no idea how easy it is for a man, well trained in the use of ground, to work a pack animal forward unseen; or else he will

attempt to go forward with it, but, never having practised, will lose direction, and the ammunition will not be available when required by the company.

Or again, a section from the support is ordered to reinforce the firing line. Off goes the section, and its commander forgets to take with his men a supply of ammunition from the pack animal for the firing line.

It should be a point of honour with every company commander that he never permits his firing line to run short of ammunition. He can only hope to ensure this if he has thoroughly taught and practised his company during training in the various methods of ammunition supply.

It must be remembered that, with all the unaccustomed distractions of war, matters that have not become habitual by practice in peace are liable to be forgotten, and the supply of ammunition is one of them.

The next point is in connection with fire orders, one of which is the sighting elevation to be put on the rifles. It is not proposed to consider this in detail as it is fully explained in Musketry Regulations, but I want to draw your attention to the training which should be given to *Range Takers* by company commanders. It is obvious that range takers must be able to take ranges accurately and quickly, but, necessary as these qualifications are, they are by no means all that is required. In order that range takers may be of value to commanders in war, they must be trained in the tactical handling of their instruments. By this is meant that well trained range takers should know, almost instinctively, the objects to which ranges will probably be required, and be able to forestall the requirements of commanders under whom they are acting.

For example, when company commanders go forward to their commanding officer to receive orders before moving off to the attack, they should be accompanied by their range takers, who will then be at hand to begin ranging as soon as they are told the line of advance.

Well trained range takers should require no further orders. While their company commanders are reconnoitring the country over which their companies will advance, and while they are explaining the situation to their section commanders, the range takers should be ranging. By the time the company is ready to advance the range takers should have taken a number of useful ranges such as key ranges, ranges to tactical localities, to various fire positions and to localities or objects towards the flanks. These ranges should be written down with a sufficient description against each to enable the person to whom they are handed to identify them.

If the range takers are untrained, what happens? They either wait for further orders, which they probably won't be given, or ask the company commander, who will probably say "take some ranges." This they will do, and will almost certainly select objects that are easy to range upon, because the

importance of accuracy has been impressed upon them, but they know nothing about tactical requirements. They will probably select such objects as a telegraph pole, the flagstaff on a house or the top of a tall chimney. Quite possibly they will write down the ranges, as often as not without any description of the objects to which they refer, or, if a description is written, it will be such as "telegraph pole, flagstaff, chimney," when there are probably numbers of poles and chimneys to be seen.

When the company advances the range may be urgently required to a certain locality. The well-trained range takers hand in the range at once, but the tactically untrained range takers hand in, perhaps an absolutely accurate list of ranges, which are of no value, because the objects can neither be identified, nor if identified, are they of any military use. The company commander in this case says and thinks a good deal concerning the uselessness of range takers and range finders generally, not realizing that it is neither the range takers nor the instruments that are at fault, but the person who should have trained the men to use the instruments in a practical manner.

This question of practical ranging is another of the matters for which want of training exacts no penalty in peace. There are no bullets in the rifles, and there is seldom time on field days and at manœuvres to check accuracy, nor is there anything to bring out the value of well trained range takers, and this induces slackness.

What has been said applies equally to the use of all range finders of whatever pattern, and, unless the training of range takers receives closer attention, commanders will lose a valuable asset in controlling the fire of their men on service.

Having dealt with individual responsibilities we come to a consideration of the guiding principles regarding the production and application of fire, *i.e.*, the *Handling of Fire*.

Before a commander issues fire orders there are certain points upon which he must make up his own mind, and it is proposed to consider three of these, namely:—

1. Choice of targets.
2. Whether fire should be concentrated or distributed.
3. The volume of fire.

1. Choice of Targets.

Targets should be selected with reference to the tactical situation, which means that generally the most dangerous target at the moment should be engaged. There is often a tendency to disregard this principle and to select a target merely for its visibility or because it presents a mark that is easy to describe and easy for the men to recognize, without regard to the tactical situation.

It frequently happens at manœuvres that a commander orders fire to be directed at an isolated bush or tree in a hedge without knowing or caring whether an enemy is there or not.

This does not matter in peace, so far as results at the time go, since there are no bullets in the rifles, but it will have a very serious result when war comes. On service under fire men do not think, but will act as they have been accustomed to act, and, if commanders have been allowed in peace, when there are none of the distractions of service, to direct the fire of their men at any object which is easy to describe, regardless of the tactical situation, they will do the same on service; the result will be that fire will be ineffective and ammunition will be wasted.

Another fault due to peace conditions frequently arises at manœuvres, namely, the men are given no point to aim at. This means that, if bullets were in the rifles, the fire of a unit which should be concentrated will be scattered, as each man will select his own point of aim or fire vaguely in the supposed direction of the enemy. Correct habits can only be ensured by careful supervision during peace training, and particular attention should be directed to stopping any tendency to slackness in giving fire orders.

In this connection it should be remembered that fire orders should be concise, and should include no more words than are necessary to render fire effective. It is therefore unnecessary and often misleading to name the target as well as an aiming mark. All that the men require to know is the mark at which they are to aim. If both the target and the mark are named the men look for both, and the opening of fire is delayed; while it is also certain that some men will aim at the target instead of at the mark. Suppose, for example, a commander wishes to concentrate fire on a machine gun, and a cross wind is blowing. If he hopes to hit that gun he must name an aiming mark which will counteract the effect of the wind. It is only necessary in such a case for the men to be told the mark at which they are to aim, without mentioning the gun.

2. Whether Fire should be Concentrated or Distributed.

The guiding principle is that fire should generally be concentrated against very vulnerable targets, or when it is required to produce great effect at a particular place; it should be distributed when it is required to disturb the enemy's aim along a portion of his front in order to assist or cover the movement of other troops.

The means at the disposal of a company commander for carrying out these principles will now be examined. They apply equally to all fire units, but the company is taken as being a convenient unit for explanatory purposes.

It is obvious that if he wants to produce great effect at a particular place he will order all rifles to be aimed at one point, for by that means he will obtain the greatest concentration and hit the enemy hardest.

The situation may, however, require some degree of distribution, and he then has the means of distributing his fire in four varying degrees.

He can order each half-company, each section, or each squad commander, to select different marks at which to order their respective units to aim. By these means he is able to strike the enemy's line in two, four or eight different places. And finally, he is able to order each man to select his own point of aim, and thus he can distribute the fire of his men to the greatest possible extent, all along the enemy's front.

Sometimes in defence, but rarely in attack, it may be possible to divide the foreground into sectors, allotting a sector to each fire unit, whose duty should be to watch for and engage the enemy within that sector. Since, however, this will not always be possible, some more general method is necessary to enable fire to be distributed in the required degree. The method is to teach fire unit commanders, when ordered to direct the fire of their men at different parts of the enemy's front, to select aiming marks which will apply their fire to that portion of the enemy's front approximating to their own position in the company.

For example, it may be desired to apply fire to four different parts of the enemy's front; each section commander would then select a point of aim for his section so that the fire of the right section was applied about the left of the enemy's line, that of the left section about the enemy's right, and so on.

The chief guides in deciding upon the degree of distribution to be employed will be the visibility of the aiming marks, the volume of fire available and the range.

Suppose that at 1,000 yards range the enemy was lining a hedge, along which were eight clearly visible trees; sufficient effect could be anticipated if each squad commander directed the fire of his men at a different tree, although there would perhaps be only 10 to 12 firers in each squad. If, however, the enemy was lying in a field with no clear aiming marks, then fire would probably be more effective if each half-company directed its fire towards about the right and left of the enemy's front respectively; because, in the absence of clear aiming marks, large and scattered groups would be obtained and therefore a considerable volume would be necessary for effect. The greatest distribution, namely, each man selecting his own point of aim should not generally be employed beyond 600 yards, owing to the difficulty each man would experience at longer distances in obtaining suitable aiming marks.

There are two objects to be gained by teaching these methods. (1) A commander is enabled to hit as hard as he can by means of concentrated fire, or is able to distribute fire in the degree required by the situation in order to disturb the enemy's aim. (2) He is able to counteract the tendency to aim at the most visible target or portion of a target, which is often done without regard to the requirements of the tactical situation, and may result in a heavy fire being directed at a dummy trench while the real trenches, being less visible, remain untouched.

3. Volume of Fire.

Volume of fire can be increased in two ways, either by increasing the number of firers or by increasing the rate of fire.

Both these have limitations. The *number of firers* is limited to a man a yard, because if men are closer they cannot use their rifles freely. This should be recognized during training, and the tendency to push too many men into the firing line should be guarded against. When the firing line is overcrowded it offers a vulnerable target to the enemy, while the effect of its fire decreases because the men are cramped in the use of their rifles.

The *rate of fire* cannot be increased beyond each man's best rate, without loss of effect and waste of ammunition. A man's best rate necessitates his rifle being aligned on the mark before the trigger is pressed, in order to ensure reasonable accuracy.

Therefore, the rate varies according to the size and distinctness of the aiming mark, and according to the range and the efficiency of the firer.

Thus the rate of fire shows clearly the direct effect of elementary training on efficiency for war. Unless a high standard is reached and continuous practice afforded in such matters as visual training, quick and consistent aiming, trigger pressing and rapid loading, the volume of fire required for active service purposes will not be obtained.

Whenever rapid fire is ordered it means that each man fires at his best rate, which, for the reasons already given, varies with individuals. This is an argument in favour of our present methods of firing as opposed to the former method of volleys.

The question of *Economy of Ammunition* is closely connected with that of handling fire.

Economy means, adequate return for expenditure, not hoarding what can be usefully spent.

Applying this meaning to the expenditure of ammunition it is apparent that it would be false economy to withold fire when adequate results are to be expected or when the tactical situation requires fire to be opened and maintained.

It is also a principle that when once fire has been opened for a particular purpose it should not cease until the object for which it was opened has been attained.

Suppose, for example, rapid fire has been ordered to assist other troops to advance to a new fire position; it would be false economy to stop firing before the advance had been completed; but it would generally be expending ammunition unnecessarily to maintain rapid fire after the advancing troops had established themselves on the new fire position.

From this it is evident that a great deal can be done towards economising ammunition by commanders who thoroughly understand the principles which govern the handling of fire. On field days and manœuvres, therefore, all firing, whether with blank or only snapping, should be governed by the require-

ments of the tactical situation and not, as is too often the case, with the object of appearing busy or of attracting the eye of an umpire.

There are a few points connected particularly with the *Attack* to which I would like to draw attention.

The main object in the attack is to get as close to the enemy as possible with the least delay in order that decisive results may be obtained by means of the assault or, if the enemy does not wait for it, by the threat of an assault: because, powerful as modern rifles and machine guns are, fire alone cannot force a decision. The first use of fire in the attack is, therefore, to assist troops to get forward and the second to prepare the way for the assault.

Great importance is to be attached to reconnaissance by company commanders before the attack is launched in order that they may gain as much knowledge as possible about the ground over which they will have to fight before advancing with their companies. This reconnaissance should be practised in peace so that on service commanders will know what to look for and will not waste the probably short time available in gaining information which may subsequently be of little value to them.

In the earlier stages of the attack the object will be to get forward rapidly and as far as possible without firing, keeping men well in hand, subject always to the particular conditions that exist, such as the nature of the ground and the enemy's fire.

The first opening of fire, when it becomes necessary, will be in accordance with the principles laid down in Infantry Training.

As the attack progresses the forward movement will be carried out by "employing the fire of men who are not moving to facilitate the movement of men who are not firing," which exemplifies the meaning of the expression that is often heard, namely, fire combined with movement.

The object to be attained by this covering fire is to keep the enemy's heads down and thus disturb their aim, in order to create opportunities for the advance to be continued. This object will seldom be gained by concentrated fire because such fire will only have effect within a restricted area, leaving the remainder of the enemy's line free to fire steadily and therefore effectively on the advancing troops. For this reason covering fire should generally be distributed along the enemy's front, and suggestions have already been made as to the methods by which this may be done.

Opportunities may also be created by the fire of artillery and machine guns. Such fire may be directed on the initiative of their respective commanders against particular portions of the enemy's front or in response to information supplied from the firing line. In either case the enemy will suddenly be taken under fire and an opportunity afforded for the infantry to

gain ground. Such opportunities must be at once seized and made the most of, for they will not last long.

In order that advances under fire may be successful the application of three principles should be practised, namely:

(1) *Covering Fire* should be maintained until the advancing troops are established on their new fire position, because as soon as covering fire ceases the enemy will concentrate his fire to stop the advance.

(2) All ranks should be imbued with the principle that to *Advance is to Win*. If this is realized, every yard of ground gained will raise the moral of our attacking troops and will adversely affect that of the enemy when he sees he cannot stop the advance. In teaching this principle it should be made clear that the wild rush of undisciplined or partially trained men, however brave individually, will be useless in modern war. What is required is the systematic advance of disciplined and well trained troops, making skilful use of ground and supported by sufficient covering fire.

(3) *Reconnaissance before movement*. This is an important duty of leaders, who should decide, as soon as a fire position is reached, where they will lead their men to in the next advance and the best way to get there. A good eye for country is necessary, and this should be developed by training. This applies equally to leaders of supporting troops. At field days and manœuvres a firing line may often be seen halted just short of or just beyond a good fire position, and supports may be noticed lying in the open fully exposed to the enemy's fire. Such faulty leading is generally due to commanders advancing without any idea as to where they are making for until it suddenly occurs to them to halt. They then often find that their men cannot see to shoot without kneeling or crawling forward. Such occurrences are entirely due to want of training in reconnaissance before movement.

In conclusion there is a matter to which reference should be made, although it merits more consideration than the time at my disposal permits. This is a question of the disorder that must inevitably arise on service. It is no use only practising methods in peace which will obviate disorder under such conditions, for, in war, whatever measures may be taken, this disorder will arise. It is necessary, therefore, constantly to practise *getting order out of disorder*. For example, a section, a half-company, or even a company perhaps of another battalion reinforces a firing line. Perhaps there are two or more section commanders close to one another. Who commands?

Commanders must be trained to quickly reorganize units and assume command, and men must learn to take orders from a commander whom they may not know.

Our Training Manuals refer to the necessity for reorganizing units whenever the opportunity occurs, but practice of this difficult matter seldom receives the attention it merits.

There are many difficulties in the way of training, and these are fully recognized, but the fact remains that if we are to defeat an enemy in war, leaders and men must be well trained, and this is only possible by constant practice in the application of tactical principles.

DISCUSSION.

Lieut.-Colonel N. Corry, D.S.O., Commanding 2nd Battalion Grenadier Guards, said that he must congratulate Col. Campbell on the excellent lecture they had heard that afternoon. It was full of sound common-sense, and, personally, he entirely agreed with everything that had been said. There were certain points which company officers had been asked to talk about, and as he had commanded a company for seventeen years he felt he had the right to stand up as a company officer, although he was now a battalion commander.

PRELIMINARY RECONNAISSANCE.

The first point was with regard to the preliminary reconnaissance. The Lecturer had emphasized its importance, and he himself did not think it could be overrated; in fact, at manœuvres it was very much underrated. He would take an example, he did not say that he had ever actually seen it, of the sort of thing that might happen at manœuvres, in case of a division being ordered to attack. The G.O.C. the Division sent for his brigadiers and explained to them what he wanted. Off went the brigadiers to their brigades; they then sent for their C.O.'s, who were probably already there in anticipation that the brigadier had the order. While the brigadier was still talking to them, a Staff officer galloped up to him and said: "The General's compliments, Sir, and why does your brigade not push on?" The brigadier said: "Gentlemen, go back to your battalions." The C.O.'s went back, and if they had anticipated the brigadier's orders they had already got all their officers and section commanders to the point they were going to, and the C.O. then attempted to do the preliminary reconnaissance. Then up came the brigade major to the C.O. and said: "Colonel —— why does not your battalion go on?" The C.O. said to his captains: "Gentlemen, go back to your companies and get on as well as you can." The captains went back to their companies, started off with their section commanders, and began explaining the situation; they then took out their rangefinder, and the man lay down and began to take his key ranges and so on. Then up came the adjutant to the captains and said: "Colonel —— wants to know why the * * * * * * you do not take on your * * * company." The result was chaos, the moment the attack went on. What they had to do, brigadiers, regimental officers, and others was to train themselves to give clear and concise orders as quickly as they possibly could.

THE MAINTENANCE OF COMMUNICATION IN THE FIELD.

The next point was the maintenance of communication in the field as regards the battalion. The other day he heard a system of communication put forward which was to drop relays of men from the firing line back to the supports, and from the supports back to the C.O., probably a thousand yards in the rear. This system had been put forward by a most capable officer with great experience, but he (Col. Corry) objected to it because it took away rifles from the firing line; and he proposed

in its place a system which he had borrowed from his former C.O., the present commandant at Hythe. That system was as follows: Within about 300 yards (or less, according to the ground) was the second in command, the senior drill sergeant, signallers with Dietz discs, and orderlies. Then about 300 or 400 yards further to the rear—according to the ground—came the junior drill sergeant with orderlies and Dietz discs, and then came the C.O. with his orderlies. He felt sure that in the British Army the importance of these Dietz discs was not realized. By their means one could send back from the firing line with perfect ease, and one could also send in a lateral direction from the firing line, which was impossible with flags; and it was this lateral communication between companies in the firing line which would ensure good covering fire being brought at the right moment.

It had been urged against these discs that they could not be read more than 500 yards behind the firing line, and also that in signalling to the front they might be read by the enemy. Well, if they could not be read 500 yards in the rear they could not be read by the enemy, who would be at a greater distance in front. Anyhow, let them take 500 yards as the decisive fire position; the C.O. signalled up to the firing line from the reserve, say, 600 yards back; this spot was 1,100 yards from the enemy, consequently the Dietz disc was invisible. He himself had used these discs for signalling up to the firing line, and had never had his battalion's name taken for exposing its signallers. He had seen them used in two battalions and regarded them as the best system of communication in existence.

THE POSITION OF THE COLOUR-SERGEANT.

The third point he wished to draw attention to was the position of the colour-sergeant. The position of the colour-sergeant in a company was with the captain, and his duty was the same as the sergeant-major's duty in the battalion, *i.e.*, to see to the supply of ammunition to the company, and also to act as an *aide memoire* to the captain, who, in the excitement of battle was apt to forget all about his ammunition. The colour-sergeant was an absolute nuisance in the firing line, as he interfered with the section commanders. Owing to the small amount of ammunition issued they had no opportunities of practising the supply of ammunition, and in the next place mules were only issued once a year, and consequently the captain had not a chance of training himself and the men in the use of them. Last year in battalion training his battalion had them on one occasion, and the captains and the C.O. promptly forgot all about them. That was entirely owing to the habit of not having them and not thinking about them. On this particular day the whole of the first line transport, by an afterthought almost, had been ordered to go up to the little knoll on the left of Saddleback Hill (Aldershot). The mules and the transport came down in full gallop in splendid order, and all bolted right over the top of the knoll in full sight of the enemy. It was the only time the drivers had ever used them or seen them in the field. On another occasion during brigade training one of the objects set by the brigadier had been the use of the ammunition mules. He went out on that day full of keenness about the mules, but while he was busy with a tactical problem, something made him think the signallers were doing wrong and he forgot all about the ammunition mules, with the result that they all remained in a heap and got into awful trouble—and he got into awful trouble afterwards too. Then

he thought, captains did not realize that an ammunition mule was part of their company. The other day he had mentioned in a lecture to his battalion how they were to practise with mules this year, and had added that he was going to take out somebody's charger to see what could be done, and that the best man of the company was to be told off to it. The captain of the company had said: "How can I look after my men and my mule?" He referred him to the War Establishments, and told him his mule was as much part of his company as the men were.

With regard to bringing the ammunition up to the firing line, the only way the ammunition could be brought up was by reinforcements, and it was the duty of the colour-sergeants to see that each section was supplied as it went up. He considered that ammunition carriers running about in the open were as extinct as the dodo!

REORGANIZING SECTIONS.

The system which he had employed for reorganizing the units was as follows: When the sections had got mixed up, the sergeants started telling off sections, thus:—Brown to Robinson, A section; Jones to Smith, B section; and so on. On these orders the men named raised their rifles to mark the flanks of the sections. When an advance was to be made from one firing position to another the captain gave the command: "No. 1 Section will advance," the sections being originally called Nos. 1, 2, 3, and 4, and in the firing line A, B, C, and D. The moment "No. 1 Section" was called out, No. 1 Section instinctively knew their sectional commander's voice, and went forward; and then No. 2 Section and No. 3 Section followed, and so on.

Drill was the foundation of all discipline, and became an instinct. Fire drill should be so frequently practised that it became a second nature, so that when the great day of battle and danger came the instinct of self-preservation would assert itself in the form of covering fire to facilitate movement.

Lieut.-Colonel F. A. MacFarlan, Comdg. 1st Battalion Q.O. Cameron Highlanders, said they had been told that the range taker was to be a corporal, who must be so highly trained as to be able to take all ranges which might be of use to the captain in advance, and also to write them down clearly upon paper. Most of the audience knew how very difficult it was, in any country, to point out an object in their front clearly, and in a few words. To do so, and to write the particulars on paper as well, would mean a great deal of work, and would require great tactical ability on the part of the corporal. No doubt they would get some corporals to do it; they all agreed that there were very many good corporals—but he was afraid it would be beyond the powers of some they knew of. But he saw no reason why the range taker should not accompany the captain; the latter could then point out to him the ranges he wanted taken, and in that way the corporal would not need to be so highly trained. It was sometimes said that there were not enough range instruments in the battalion, but they were really wanted only with the four leading companies, because, as a rule, in the attacks they practised now, the four rear companies came up into the firing line and got the ranges when they arrived there.

COVERING FIRE.

A great deal was heard, nowadays, about covering fire, and it made him think they ought to trust to their friends the gunners far more

than to themselves. This covering fire could be carried out by the gunners with absolute accuracy, and the difficulties of training were not so great for them as for the infantry, as they were trained to that alone, and they did not have to train so many men to get perfection. He knew that if he ever had to start an attack, the first thing he would ask was: "Where are the gunners?" and he would never start an attack until he had made sure that there were some of them near by ready to support him.

Lieut.-Colonel R. J. Marker, D.S.O., Coldstream Guards, said that he had one or two remarks to make on Col. Corry's statement as regards the paucity of mules.

PRACTISING AMMUNITION SUPPLY.

It was most important to train a mule if one could get him, but if not there were many simple ways of practising the very important question of ammunition supply; it was not the mule one wanted to train, but the man in charge of the mule. What was needed in order to ensure the supervision and training of that man—whether one was a captain or a commanding officer—was to be able to see at a glance how he was moving, where he was, and to make sure that he had something to represent ammunition. Certainly he agreed with Col. Corry that the supply of blank ammunition was sometimes short, but it could be represented in other ways. He thought the system that was tried last year when his battalion was in Gen. Maxse's brigade, would explain what he meant. On all occasions of company, battalion, and brigade training, the man who was told off to lead an ammunition mule carried a company colour flag. When the battalion was in action it was easy at once to pick out the position of any company's ammunition mule. There was always one real mule available, few as there were, for work with the battalion, and that mule was loaded with four ammunition boxes which contained small blocks of wood representing ammunition. In future this mule would carry a certain proportion of bandoliers loaded with these blocks, and a certain proportion of empty spare bandoliers. As soon as the battalion went into action the load of that mule was distributed, partly among the men representing the ammunition mule leaders—and as it was light they could take a considerable amount—and the remainder was given to the drummers, who were put under the command of the sergeant-major and represented the battalion reserve carts.

THE INFANTRY BRIGADE RESERVE OF AMMUNITION.

There was one point in connection with carts which had to do with "Infantry Training," which he did not think was quite understood, and that was the formation of an infantry brigade reserve of ammunition. They were told to use a third of the battalion reserve to form a brigade reserve. To start with, 50 rounds extra a man had to be served out as soon as an engagement appeared imminent; that would empty three carts out of the five straight away. Therefore the brigade reserve carts must go back to their specially detailed officer absolutely empty, and would at once, of course, have to apply to the artillery ammunition column to be refilled. That left only two carts for the immediate purpose of battalion supply when an action commenced. In practice it was easy to tell off the drummers to represent those two carts;

they could carry a sufficient supply of empty bandoliers, the full bandoliers being taken by the company ammunition mule leaders whose business it was to work up, as they would under fire, as near as possible to the firing line. It was then the business of the colour-sergeant, as Col. Corry had said, to see that no reinforcements went up without taking some further ammunition supply for the firing line. Directly that ammunition supply was exhausted, it was the mule leader's business to work his way back, under cover if possible, to the sergeant-major and replenish from the carts. In that way one could check at any period of an attack, or a defence, how the ammunition reserve was actually being used, by the number of blocks which had been taken up to the firing line, or the number of spare bandoliers which were present with the firing line. It took a little working, and did not go smoothly at first, but practice soon made it work automatically. The use of flags also made it easy to watch the course of the ammunition mules and see that they were only taken where they could move during an action.

Dr. Miller Maguire, LL.D., said it seemed to him passing strange that the only officer who, so far, had referred to combined operations was his gallant Highland Scotch friend, who practised the usual caution of his country, and would not under any circumstances go into action unless he was thoroughly well supported by a heavier arm than his own. He commended the caution of the distinguished officer. He found that every word he said was supported by all great military writers.

He had never heard a mule get so much attention in any congregation as he had to-day. He was able to support Col. Corry's theory of mules by a reference to General Stonewall Jackson, who, they would agree, was a good authority. General Stonewall Jackson was a religious man, and ordered people not to swear in his regiments, and the result was that the ammunition columns were stuck dead at a small stream. The mules could not be got to move one step. Ultimately a corporal came up and saluted the distinguished officer and said: " May I point out to you, Sir, that these are Texas mules." " What is the meaning of that?" asked the General. " Well," said the corporal, " you were never in Texas or you would know they swear a little there." " Oh, get on anyhow," said General Jackson, and retired to the rear. The corporal practised the linguistic tactics of Texas, which included, he believed, a good deal of * * * * * * referred to by the gallant Guards Colonel, and immediately the mules moved off at a trot. The result was that the enemy was beaten, entirely through the humble instrumentality of a cursing corporal. He desired to add that he had passed the corporal's examination himself, with distinction.

With regard to ammunition, one of the peculiarities of the recent wars, was that they all expended an enormous amount of ammunition. A regiment of Siberian Sharpshooters fired on the 30th and 31st August, 1904, 1,200,000 cartridges, until the very wood of the rifles was burnt and the bayonets were almost dropping off through being fused. The question of ammunition supply was of the utmost possible importance. He ventured to say that they never would abolish steel in connection with the troubles of humanity, and the bayonet remained in spite of all the ingenious and far reaching improvements of modern rifles.

Cold steel was reverted to in the Manchurian campaign, when no amount of fire was able to carry positions. But the bayonet carried in

a few moments strong works, and with Russians, as the great Suwarrow said, the bayonet is the master.

The Lecturer, in reply, said: I have very little to say, but there is one point which I think requires emphasizing in regard to what Col. Corry said about the importance of communication. I think there is very often a tendency to look upon telephones, Dietz discs, signallers, and so on, when we have got them, as being always available. It is important that we should remember that these can be only regarded as supplementary to the verbal and written message. Often in a crisis on service your telephone will break down, your signaller cannot use his flag, you cannot semaphore, your Dietz disc is broken, and all you have to rely on is the man who carries a verbal or written message, or the passing of verbal messages, as the case may be. Therefore, I think in training we cannot devote too great attention to using the man and the written or verbal message. Of course, Dietz discs and all other methods ought to be practised, but I do not think we should overlook the verbal and written messages.

REORGANIZING DURING THE ADVANCE.

There is a point I should like to mention with reference to reorganizing during the advance as distinct from reorganizing the firing line when under fire, and that is the principle of taking advantage of cover, when opportunities occur, to get the men in hand. It seems to me very important that on service we should get the men under control whenever possible, because, under certain conditions, they easily get out of hand. For instance, in advancing, it might happen that you dropped into a hollow piece of ground for a short distance, and that might be a suitable time to close the men. The effect of closing them, even for a very short time, and getting them into the grip of their commanders will do a great deal towards maintaining discipline, including fire discipline, for a longer period than might otherwise be possible.

RANGE TAKERS.

With regard to Col. MacFarlan's points about the range takers. It seems to me that if a corporal is a selected man, as he should be, and if he has received training, he ought to be able to do a good deal. The fact remains, however, and we cannot get over it, that if you have a range taker who cannot supply the ranges required, you lose the value of having range takers at all. With regard to the captain pointing out the ranges: the captain has an enormous amount to attend to, such as ammunition supply, fire direction, examining the ground, watching the enemy, seeing how he can assist neighbouring troops, or how he can take advantage of any assistance given to him, watching for the help of artillery fire, looking out for opportunities of getting on if given a chance, and, with the distractions of service in addition, he will not have time to tell the range taker what to do. I cannot help thinking that you can give the range taker, even though he be a corporal, a sufficient insight into what is required of him to be able to trust him to take practical ranges which would be of military value.

Then as regards artillery support, we shall always hope for and welcome it, but it will not always be available. Infantry should therefore learn how it can assist itself to get forward by rifle and machine-gun covering fire.

The Chairman: It only remains for me to voice the opinion of this audience by thanking Col. Campbell most heartily for his lecture. What struck me most about it, when I first read it, was that it was brimful of points requiring thought and consideration; points which will help company officers to carry out the principles of "Infantry Training." As you know, there are different methods of carrying out those principles, and I think several of the points Col. Campbell gave us indicate various good ways of training men. The aim of modern text books is to inculcate principles and leave the methods of carrying them out to individual instructors, that is to say, to company officers and others.

THE IMPORTANCE OF DEVELOPING LEADERSHIP.—Thinking over the lecture, what strikes one is the necessity of developing *leadership*. Every commander of a unit has to think out how he can best develop the quality of *leadership* in his subordinates. There are a great many authorities in the room who know this subject better than I do, but I think I am well within the mark when I say the probability is that in the future we shall have frequently to engage in what are called "encounter battles," not prepared contests, but battles which will arise suddenly.

RECONNAISSANCE.—There has been some very excellent criticism by Col. Corry upon the difficulty of the reconnaissance; he described in graphic language the hustling by the Divisional General, the Brigadier-General, and the commanding officer, and indicated how little time they give for reconnaissance. I agree with a good deal of what he said, but just look a little closer into it. I submit to you all that during company training and during battalion training those reconnaissances are possible and should be undertaken. They are excellent training for the section-commander, because they make his mind work quickly and make him think. They prepare him for the battle of encounter. Even though we admit with Col. Corry that reconnaissance is difficult during higher training, nevertheless I urge that it should be utilized as a method of instruction throughout company and battalion training. Of course, the whole object is to get alert leaders and handy sections.

If we are ever again to engage in a European contest on the Continent it is perfectly obvious that we shall be in small numbers as compared with our enemy. Therefore we can only expect to win battles by means of superior leadership and superior fire tactics. Fire tactics enabled us to win many actions in the past, from Agincourt to Waterloo. They were then a British characteristic; but we need to study them and practice them under modern conditions. The point I think we will do very well to carry away is that this lecture requires thinking over, and applying as soon as we get to company training. Meanwhile we are very grateful to Lieut.-Colonel Campbell for delivering it to this big audience.

THE POSITION OF THE TORPEDO IN 1911.

Translated from *Nauticus*, 1911, and published by permission.

I.—THE TORPEDO.

Introductory Remarks.

IN an article in *Nauticus* for 1907, entitled "The latest development of the Torpedo," the course which the development of the torpedo appeared to be taking as a result of the experience gained in the Russo-Japanese War was discussed in detail. The main points may here be briefly repeated:—

1. Measures for increasing the effect of the explosion of the war head on the target;
2. Increase of the range;
3. Increase of the speed of the torpedo.

In order to effect the last two improvements, efforts were directed towards increasing the capacity of the air chamber, raising the pressure of the air, and introducing a heating arrangement so as better to utilize the compressed air. During the last four or five years the construction of warships and the whole science of armaments have made extraordinary progress. The distinguishing feature of this period is the endeavour which has been made in all countries to increase the power of the means of attack.

These efforts led to a considerable increase in the displacement of ships with a view firstly, to enable them to attain the speeds which appeared desirable for tactical and strategical reasons; secondly, to allow of their carrying the weapons necessary for fighting at long ranges; and finally, to make it possible for these costly ships to be suitably protected above and below water.

This increase in the size of ships has not been limited to battleships. The dimensions of the small cruiser and the torpedo boat, as well as those of the various intermediate types, have undergone a corresponding increase.

From the beginning of this period of development, almost all the Powers, following the example of Great Britain, endeavoured, to a degree which had not formerly been customary, to maintain secrecy regarding the structural details of their ships. This was especially the case as regards the under-water protection and the torpedo armament.

The explanation of these precautions lies in the desire to prevent the results of hard work and costly experiments from becoming generally available. The Press has, of course, repeated published brief reports about experimental bombardments of obsolete ships, and has also given information

regarding experiments with torpedo war-heads and mines on models of new ships; such experiments were reported, for example, in France, on a model of the under-water portion of the battleship "Mirabeau," in Italy on the old battleship "Morosini" fitted with a new bulkhead system, and in the United States on the old reconstructed armoured vessel "Florida." Practically the only information which has been made public with regard to these experiments is that they were very expensive and that every care was taken to preserve strict secrecy regarding details. The information available is consequently very scanty. (See also the article on "The Development of Under-water Protection.")[1]

In the domain of the torpedo the desire for secrecy has led all the principal Powers to manufacture torpedoes, as far as possible, in Government workshops. It will be of interest to consider briefly the advantages and disadvantages of this policy.

Advantages and Disadvantages of Government Manufacture.

1. The main advantage of Government manufacture is that it renders a State independent of foreign workshops. This particularly applies to countries in which private firms have little experience in the manufacture of torpedoes, and which would, therefore, be obliged to rely on foreign supplies. In case of war the advantage of Government manufacture would, in such cases, be especially apparent.

2. Secrecy is more easily assured in Government works, for, in them, the Naval authorities can make their wishes respected (especially as regards the superintending personnel), to an extent which would never be possible in the case of a private firm. Indeed, in private firms' works secrecy is only practicable to a limited extent. Private firms must be allowed a free hand in business matters, especially as regards patents, and this practically amounts to allowing all important technical improvements to become public property.

3. Government works offer the best guarantee that the torpedo shall develop exactly on the lines which are most in accordance with the requirements of war. Officers, engineers and officials are the best judges of these requirements and will see that they are never lost sight of, especially during experiments. The great care which should be devoted to the development and perfecting of the torpedo, the manner of which must depend upon the ideas prevailing as to its tactical employment, cannot be expected to the same extent from a private firm.

There are naturally some disadvantages to be set against these very important advantages, for example, the necessity of expanding Government workshops beyond the ordinary requirements of peace so as to provide for the increased demands

[1] See page 390.

that will be made upon them in war; this is one of the principal reasons for the costliness of Government manufacture.

Moreover, Government manufacture, if carried out on a monopoly system, may, under certain conditions, actually retard development by killing all competition.

Torpedo Workshops.

According to Press information the various maritime Powers have the following sources of supply for torpedoes:—

Germany makes her torpedoes principally in her Government works, the Imperial Torpedo Workshop at Friedrichsort. Occasionally torpedoes have also been obtained from the Whitehead works at Fiume. The firm of Schwartzkopff, Berlin, have supplied, and still do supply, torpedoes to the Naval authorities.

Great Britain obtains her torpedoes from Government works, the Royal Gun Factory (which has been at Greenock for some little time), and also from the Whitehead parent firm at Weymouth. These latter works supply the British Navy almost exclusively.

The United States of America formerly obtained torpedoes, and their accessories, exclusively from the Whitehead works at Fiume. In recent years they have ordered from the American firm which supplies the Bliss-Leavitt torpedo. In addition, Government works (the Naval Torpedo Factory at Newport) opened in 1909, are engaged in the manufacture of torpedoes for the Navy.

France has, in the past, always obtained a large number of her torpedoes from Whitehead, Fiume, and has given this firm large orders. Since 1884, however, torpedoes have also been manufactured in Government works, and recently efforts have, apparently, been made to become independent of foreign supplies by ordering from private firms (Schneider, Creusot, and the Société Lyonaise).

Italy, Japan, Russia, and the other maritime countries also obtain their torpedoes partly from the Whitehead firm at Fiume. Efforts are, however, being made generally towards nationalization, and a large number of State workshops have been constructed in recent years. (In Italy, at San Bartolomeo Spezia; in Japan at Kure; in Sweden at Karlskrona).

Features of the Development of the Torpedo.

Although it is not easy to estimate correctly the value of the few details which have become known regarding the development of the torpedo in various navies, still, by careful study the main lines on which this weapon has progressed since 1907 can be followed. In any case, so far as it is possible to predict the development of the science of armaments for a series of years, some general indication can be given as to the direction in which the development of the torpedo is tending.

INCREASE OF THE RANGE.—The torpedo was obliged to join in the general advance which was characterized by the introduction of long fighting ranges. The ranges of 3,000 to 4,000 metres (3,280 to 4,370 yards) which were predicted as practical in 1907 have been attained by the torpedoes of all navies. In Great Britain and the United States a further increase has certainly been obtained.

At the present time this increase of the range is the most important fact with regard to the torpedo, and is of the greatest significance in the development of the battleship. (See also the article entitled "The Development of the modern Battleship," in *Nauticus*, 1911).

INCREASE OF THE EXPLOSIVE CHARGE.—The weapon has been further improved by the increase of the explosive charge in the warhead. This development had become necessary owing to the strengthening of the under-water protection of ships, especially of large ships. (See article on "The Development of Under-water Protection."). This strengthening, which consisted of a further sub-division of the water-tight compartments and, in some navies, the provision of inner armour, very considerably reduced the prospects of successful torpedo attack with the explosive charges previously employed. It was, therefore, essential to increase the charge in order that the object in view, viz: that every ship struck should receive vital damage, should still be capable of attainment under the new conditions.

INCREASE OF THE SPEED AT SHORT RANGES. The increase of the speed of ships, both maximum and cruising speeds, threatened to reduce the chances of making hits. This has been met by a very considerable increase in the speed of the torpedo at short ranges. We shall deal with this more fully later on.

Employment of the Torpedo in War.

Before commencing a detailed consideration of the increase in the speed of the torpedo, it is necessary to make a brief study of its probable employment in war. In the first instance we must distinguish between torpedo attack by day and torpedo attack by night.

TORPEDO ATTACK BY DAY.—Torpedo attack by day will probably, in most cases, be limited to torpedo attack by squadrons of battleships, or perhaps by squadrons of armoured cruisers, on one another. In such attacks, the submerged torpedo armaments of these two types, which are the principal participants in daylight actions, will be made use of. Up to the present the torpedo has not of course, been the main weapon of these types of ships, but as a result of its increased power, it has had an important influence on their development. If, however, the range of the torpedo is increased to that now considered usual for fleet actions, and if the chances

of hitting are considerably improved, then there is a prospect of the torpedo developing into a main weapon in such actions. In the articles in *Nauticus* of 1905 and 1907 it was carefully pointed out that uniform speed and reliable control of the course were essential conditions for the employment of the torpedo at long ranges. If these are not attained the chances of hitting are not worth considering. It may be added that hits at long ranges can only be achieved with the aid of an accurate sighting-apparatus (*Visier-apparat*). Small cruisers and even torpedo boats may have opportunities for firing torpedoes at long ranges in daylight actions. The difficulty lies in the fact that the torpedo boat is so easily damaged, while the torpedo itself is even more sensitive to injury, so that it will rarely be possible for them to get close to the enemy without being disabled. The prospects of their being able to do so will, however, increase if the torpedo ranges become so great that gun defence is rendered difficult, and if a large number of boats attack simultaneously. The English and French Press repeatedly mentioned experiments of this nature with large flotillas of torpedo-boat destroyers during the fleet exercises last year.

There is also the question of torpedo attack by submarines, but this, of course, is only possible at short ranges; on the one hand, the chance of hitting at long ranges is negligible owing to the necessity of estimating the speed and course of the enemy through the periscope, and on the other hand, the submarine is able to preserve its invisibility and invulnerability until at a very short distance from the enemy, and thus has a very good chance of making a hit.

TORPEDO ATTACK BY NIGHT.—Torpedo attack by night was originally the task for which the various types of torpedo boat were intended.

Darkness enables the boat to approach unobserved, but at the same time it limits the use of the torpedo to short ranges. The speed, course and manœuvring of the hostile ship are difficult to estimate, especially if the crew of the attacking torpedo boat are blinded by searchlights.

The prospects of hitting are, therefore, favourable only at ranges at which even considerable errors of judgment are not likely to lead to a miss. The greater the speed of the torpedo, the greater is the chance that an error of judgment will not result in a miss and the longer is the range at which there is a reasonable chance of hitting. In order to improve the prospects of hitting, it is, of course, also desirable that this speed should be uniform. The range for the torpedo in night attacks cannot be very great; it is never more than 1,000 metres (1,090 yards) and, according to Press information, is only a few hundred metres in the case of some nations.

CHARACTERISTICS OF THE MODERN TORPEDO.—An attempt has been made in the preceding pages to point out the

characteristics on which the military value of a torpedo depends, namely :—

1. Long range for daylight actions;
2. A powerful explosive charge;
3. High speed for night attacks.

Performances of the Torpedo in Various Navies.

There is, of course, less reliable information available regarding the above than regarding any matters relating to the torpedo. One has to fall back on suppositions, comparative deductions, and isolated reports, for the accuracy of which no unqualified guarantee can be given.

THE 45 CM. (17.7-in.) TORPEDO.—Hitherto the main calibre for the torpedo in the case of all countries has been 45 cm. (17.7-in.). This torpedo was introduced about 1890. During the past 20 years extraordinary success has been achieved in perfecting it. Most probably this long period of development has given all progressive navies the opportunity to profit by improvements which individual firms had effected during the first few years of the period. It will, therefore, be safe to assume that the various navies have obtained practically the same results with the latest product of this long period of development, that is, the torpedo as it was in the period 1907 to 1910. This applies, of course, to torpedoes of approximately the same length.

Reliable data regarding results obtained by any nation with the 45 cm. (17.7-in.) torpedo (provided it is of recent construction) will, therefore, give a good basis for considering the general position of the technical science of torpedoes at the commencement of 1911.

THE WHITEHEAD TORPEDO.—It is well known, and has already been mentioned in discussing the sources of supply of torpedoes in the case of the various navies, that in recent years the French navy has been endeavouring to manufacture torpedoes at home and so render itself partly independent of the Whitehead firm at Fiume. With this object, comparative experiments have been made, and apparently have been very thoroughly and carefully carried out, between the productions of the principal firms supplying torpedoes, namely Whitehead (Fiume) and Schneider. The fact that at first, owing to a mistake, statements obviously false regarding the performances of the respective torpedoes were published in the Press, caused the Whitehead firm to publish the correct data, and from these we extract the following :—

" At ranges of 1,000, 2,000, and 3,000 metres (1,090, 2,190 and 3,280 yards) our latest torpedoes attain speeds of 40, 34 and 29 knots, respectively, that is the same speeds which were quoted as showing the superiority of the French productions. These speeds are, moreover, those which we guaranteed in the contract which we concluded with the French Naval authorities

in May of this year, but they were actually exceeded during the acceptance trials in every case. As regards the amount of deviation relatively to the range, what we guaranteed was considerably less than that of the torpedoes which were compared with ours. We guarantee, not one hundredth of the distance covered, but .6 per cent. in 1,000 metres (1,090 yards), .75 per cent. in 2,000 metres (2,190 yards), .83 per cent. in 3,000 metres (3,280 yards), etc."

This shows that the two firms have obtained approximately the same result with the torpedo. The small superiority of the Whitehead torpedo may be attributed to the greater experience of the older firm. It is not definitely stated in the reports that the two types of torpedo compared had charges of exactly the same weight or were of the same length, but this may be assumed.

THE LENGTHENED 45 CM. (17.7-in.) TORPEDO.—In England the development of the 45 cm. (17.7-in.) torpedo is apparently not yet regarded as concluded. Various Press reports leave no room for doubt that extensive experiments have been made on board the British experimental ship "Hibernia" with a lengthened Whitehead torpedo. They state that, in spite of its length, the employment of this torpedo for the submerged broadside armament presents no difficulties.

A lengthening of the torpedo naturally means an increase of its capabilities, as regards range, speed, or explosive effect. In this case it is probably an increase of the range, as the newspapers have several times referred to an English 45 cm. (17.7-in.) torpedo running 6,000 metres (6,560 yards) at a good speed. How this increase of range is attained can, of course, only be conjectured. As however, the lengthening of the torpedo is not, according to Press information, very great, the great increase in the range cannot be attributed to length alone, but must be due to an important improvement in the motor, the driving mechanism, or the installations connected therewith (heating apparatus). In this way a range of 6,000 metres (6,560 yards) may very well have been achieved with the 45 cm. (17.7-in.) torpedo.

RANGES.—With the old 45 cm. (17.7-in.) torpedoes, ranges of 3,000 to 4,000 metres (3,280 to 4,370 yards) with about 30 knots speed may generally be reckoned on, but, in the latest ships, 45 cm. (17.7-in.), and in isolated cases also 53 cm. (20.9-in.) torpedoes, which attain ranges of 6,000 metres (6,560 yards) and over (see above) with equal or higher speeds have already been adapted. Occasionally, as used to happen when the importance of long ranges was first recognized, the speed is reduced in favour of the range, just as with a warship the speed is reduced in order to increase the radius of action. With the torpedo this reduction of speed is attained by reducing the tension of the air-pressure regulator, which lowers the pressure of the air in the air-chamber to the working-pressure in the engine. The

torpedo engine can then utilize the air for a longer period and the torpedo travels a greater distance. There are, of course, limits to the reduction of the working-pressure, as it is impossible for an engine designed for a certain speed to work economically with any air-pressure that may be desired. It is, however, very important to observe the greatest economy if long ranges are to be attained.

How far the working-pressure in the engine is lowered, or in other words, how far the speed is, or must be, reduced, in order to obtain long ranges, depends entirely upon tactical considerations regarding the employment of the torpedo. The reduction of the speed has the immediate effect of reducing the chance of hitting, as was fully explained in *Nauticus* for 1905. The period of time is longer, and the error in the aim, due to an inaccurate estimation of the course and speed of the target, increases correspondingly.

Considering the great, if not supreme, importance of being able to use the torpedo at long distances, it appears obviously desirable to reduce the speed of the torpedo, if this enables it to participate in long-range actions. With the reduction of the speed, however, the time during which the torpedo is travelling towards its target is increased, which puts certain limitations on the possibility of its employment. One report states that in Russia the latest Whitehead torpedo is fired at ranges of 5,000 metres (5,468 yards) with 28 knots speed. This is probably the lowest speed practicable.

MAINTENANCE OF DIRECT COURSE.—The introduction of long ranges naturally depends on whether it is possible to control the torpedo and keep it on a direct course. With regard to this there is again no definite information, and it is therefore necessary to fall back on deductions from Press reports. Amongst other information available, the comparative trials of the Whitehead and Schneider torpedoes give a good idea of modern achievements and the statements published regarding them (see above) may serve as a basis for further discussion.

That the apparatus for maintaining a direct course for long distances has been considerably improved as compared with the original Obry apparatus need not be specially emphasized. The new apparatus, however, does not appear as yet to work absolutely reliably. The French and British papers constantly report circuitous runs which have resulted in damage to their own ships or torpedo boats. The United States have also had unfortunate experiences with gyroscopes when firing at long ranges. It has become known through the technical Press that a contrivance invented by Lieutenant-Commander Cleveland-Davis, which is to be introduced, will render harmless a torpedo that has travelled far from its course through a failure of the gyroscope. A similar arrangement is said to be undergoing experiments in Great Britain. It cannot, therefore, be said that the development of the gyroscope has quite kept up with the increase in the ranges; in some cases it is obviously behind.

Important results have, nevertheless, been achieved in Great Britain; it appears that 53 cm. (20.9-in.) torpedoes maintain direct courses at ranges of 6,400 metres (7,000 yards), and in Japan still better results are said to have been obtained.

SPEED AT SHORT RANGES.—The speed obtained at short ranges with the latest 45 cm. (17.7-in.) torpedo, namely 40 knots, is a very considerable improvement. Moreover, further increases do not appear improbable.

War Heads.

(A) WEIGHT OF THE CHARGE.—Fewer details regarding the charges of the latest 45 cm. (17.7-in.) torpedo and the new large calibre torpedo have been published than about any other point. The few figures which have been published abroad concerning the weight of the charge appeared at the time of the introduction of the 53 cm. (20.9-in.) torpedo intended for the "Orion." The following comparative figures were then published: 35 cm. (13.8-in.) torpedo, 38.6 kilos (85 lbs.); 45 cm. (17.7-in.) torpedo, 93 kilos (205 lbs.); 53 cm. (20.9-in.) torpedo, 113.4 kilos (250 lbs.). These figures have been repeated in various English technical papers and in the daily Press, of course, with some minor variations. Generally, it may be accepted that the charge in the case of the 45 cm. (17.7-in.) torpedo weighs about 100 kgs. (220 lbs.), and in the case of the 53 cm. (20.9-in.) torpedo, up to about 120 kgs. (264 lbs.), perhaps even 130 kgs. (287 lbs).

(B) THE NATURE OF THE CHARGE.—Very little more information regarding the nature of the charge is available than was given in *Nauticus* in 1907. The charge is, it is assumed, in the case of most nations, still compressed wet gun-cotton containing about 20 per cent. of moisture. This material possesses, as is well known, great advantages in regard to reliability in firing, durability for storing, and safety of transport. The employment for war heads of picric acid (under the name of "Shimose" in Japan and of melinite in France) is of course probable, but this makes no difference in the value of the torpedo, as picric acid has no advantages over wet gun-cotton.

In recent years, however, progress has been made in the study of explosives and their manufacture as well as in other branches of technical science. As to whether any success has been achieved in bringing out a more effective explosive, which would be suitable for the charges of torpedoes in war, nothing definite is known. Only once have experiments with explosives for torpedoes been mentioned in the Press.[1] This was with reference to the question of the employment of gun-cotton charges made from one piece, concerning which long and costly experiments had been carried out at the United States Naval Torpedo Station at Newport.

[1] *Engineering* of 28th January, 1910.

The conclusion arrived at was that the combustion of the warhead made up from separate pieces is more favourable for the rapid development of the detonating gases.

We have hitherto dealt almost exclusively with the 45 cm. (17.7-in.) torpedo. This torpedo has now almost completed its development and the general introduction of a larger calibre seems imminent. What science has already done must be regarded as a great achievement. From a short-range weapon, which could only be used with any certainty at ranges of 300 to 400 metres (328 to 437 yards), the 45 cm. (17.7-in.) torpedo has been developed into an accurate long-range weapon which now attains ranges of 4,000 metres (4,374 yards), in England even 6,000 metres (6,562 yards), with good prospects of hitting the target. This progress is due, firstly to two important inventions, that of the gyroscope and the air-heating apparatus, and secondly, to improvements in the material, the economy of the engines, etc.

Increase of the Calibre.

The introduction of a larger calibre may be regarded as a certain proof that it is generally intended to make the torpedo play a much more important part as a weapon for use in fleet actions than it has done up to recent times. First, the United States went over to the 53 cm. (20.9-in.) torpedo (the Bliss-Leavitt); then England followed with a 53 cm. (20.9-in.) torpedo of her own manufacture, and the report that Whitehead is engaged in the construction of a torpedo of the same calibre gives ground for surmising that this calibre will soon become international. The transfer to a larger calibre is, of course, at first attended with numerous disadvantages. The necessity of providing new plant, the difficulties of manufacture, the unavoidable reduction of the output, the loss of uniformity of armament and the effects which this has on construction, on the training of the personnel, on the provision of stocks and on the employment of the weapon, are all difficulties which can only be indicated in this article. They render the development difficult, but they cannot prevent it.

(A) GREAT BRITAIN: THE 53 CM. (20.9-IN.) TORPEDO.—All the British technical periodicals and the daily Press have reported that experiments have been going on for some time with a 53 cm. (20.9-in.) Whitehead torpedo, and that they were brought to a successful conclusion in 1910. This torpedo has been installed on board the latest torpedo-boat destroyers in commission, and is also being supplied to the battleship "Orion," the armoured cruiser "Lion," and subsequent ships.

The length of this torpedo is 18 feet 6 inches. The range is reported to be 7,000 metres (7,655 yards), with a speed of 30 knots. For short ranges a speed of over 40 knots is said to be attained. The distance which the torpedo can run at this latter speed is not mentioned. The charge is said to have been increased from 90 kilograms (198 lbs.) to 113 kilograms (249 lbs.)

(see also above). These figures were stated to be the acceptance conditions. If we compare these figures with those for the latest unlengthened 45 cm. (17.7-in.) torpedo (30 knots for 4,374 yards with 198 lbs. charge) we get the following as the increase with the 53 cm. (20.9-in.) torpedo: range, 60 per cent.; charge, 26 per cent. A newspaper reporter stated that the new torpedo to be installed in the "Orion" and later ships has a charge about 20 per cent. greater, a range about 50 per cent. greater, and a speed about 10 per cent. greater. The latter figure evidently refers to the high speed at short ranges and would make it about 42 knots (formerly 38 knots).

The "Orion" torpedo is obviously the first type of 53 cm. (20.9-in.) torpedo. It is manufactured in the Royal Gun Factory at Greenock. There is, however, already some talk of a second improved type of 53 cm. (20.9-in.) calibre which is generally referred to as the Hardcastle torpedo, after its inventor, an engineer officer. According to newspaper reports, results have been obtained with this latest torpedo which a short time ago would have been considered incredible, but which can now be regarded as quite possible. It is stated to have run 9,843 yards at 30 knots and to have attained an exceptionally high speed at short ranges. The charge is also stated to have been increased as compared with the first 53 cm. (20.9-in.) torpedo. These improved results with the new type appear to have been attained chiefly through a considerable increase in the length. They can scarcely have been attained with compressed air alone, even with very economical engines; it is therefore highly probable that this is a steam torpedo.

(B) UNITED STATES: THE BLISS-LEAVITT TORPEDO.—In 1908 the United States Naval authorities first introduced a torpedo of 53 cm. (20.9-in.) calibre, which is manufactured by the Bliss Company. Its principal feature is that it is driven by turbines. So far as is known it is the first and only experiment with this form of motive power in torpedoes. The results obtained in this case from the increase in the calibre show a comparatively small improvement; this has repeatedly been the object of sharp criticism in the daily Press, the short range, by which the range for daylight action is obviously meant, being particularly condemned. The explanation of this failure is, probably, the employment of the turbine, which does not appear to have been a success.

The value of the hot-air turbine and of the steam turbine lies in their capabilities for attaining high speeds. On the other hand, they do not work economically at low speeds. The maximum economy at low speeds is, however, an essential condition for the attainment of long ranges. In this respect the United States 53 cm. (20.9-in.) torpedo cannot be compared with the British. At the same time we must not fail to recognize what has been achieved by the former as regards weight of charge and short-range speed; the charge appears to have been considerably larger than in the British torpedo.

It may be estimated that this torpedo, with a charge of 331 lbs., will run 1,000 to 1,500 metres (1,094 to 1,640 yards) at a speed of 40 knots, 4,000 metres (4,374 yards) at 30 knots and 5,000 metres (5,468 yards) at a considerably lower speed. It must be acknowledged that the United States torpedo industry has recently led the way, and with the manufacture of this type has given good proof of its capabilities.

(C) JAPAN.—The question as to whether Japan has introduced a new torpedo of larger type is, according to the Press reports available, still an open one; only experiments with a gasoline torpedo of 60 cm. (23.6-in.) calibre have been mentioned. This is apparently driven by a multi-cylinder "circularly arranged" explosion motor. Whether good results have been obtained with this torpedo in competition with other types is, in view of the recent striking achievements of the hot-air steam torpedo, doubtful. It is reported that it can be fired at ranges up to 10,000 yards with a good maintenance of direction.

Japan has, in all probability, already adopted the 53 cm. (20.9-in.) torpedo, following, as always, the example of Great Britain; the fact that no definite information has been published can only be attributed to the exemplary national discipline of her people.

(D) FRANCE.—Reports regarding experiments with a 60 cm. (23.6-in.) torpedo have come from France. The French naval authorities purchase largely from Whitehead, and have again this year ordered a large number of 45 cm. (17.7-in.) torpedoes from Fiume; as soon as they feel the need of a larger calibre they will probably be able to obtain the 53 cm. (20.9-in.) from Whitehead. In any case this is much more likely than the introduction of a 60 cm. (23.6-in.) torpedo, which would offer considerable difficulties to the torpedo service of even very advanced nations.

The Angled Torpedo (Winkeltorpedo).

Before the employment of the new torpedo of very large calibre is further considered, some reference must be made to an invention which has already been discussed in *Nauticus* (1907) and which at least alters the prospect of the torpedo, if it does not mark an entirely fresh departure. The invention referred to is the so-called angled torpedo. Prominence was formerly given to the independence of the angled torpedo of the bearing of the tube. In the meantime reports have appeared that efforts are being made in France and Great Britain, and also at Fiume, to make practical use of the invention. If perfected for service use, it would enable constructors to place the torpedo tubes in the position which is most favourable for launching the torpedo.

Whether the limitation stated in *Nauticus* for 1907—namely, that the angled torpedo is only suitable for service if

the angle can be altered at any time—still holds good, appears open to question. It certainly has not retained its full force, because a torpedo which can be set for a definite angle before loading possesses considerable advantages.

The difficulty of introducing angled firing lies, apparently, only in the fact that the angle setting arrangement means a new complication in the gyroscope which may affect the capability and reliability of the latter—a dangerous possibility. There is, however, no doubt that this purely technical difficulty can be overcome, and that in the near future the presence of the angled torpedo in the principal foreign navies will have to be reckoned with.

Other Types of Torpedo.

(A) THE DAVIS SHELL TORPEDO.—The shell torpedo invented by the American Davis is different in principle from all the other types which have been dealt with. A short gun, which fires a shell into the interior of the hostile ship, when the torpedo strikes, is carried in the torpedo head. The detonator is, according to the patent specifications, an electrical contact detonator with a safety propeller similar to that of the other English and American torpedoes. The invention can be fitted in the ordinary 45 cm. (17.7-in.) and 53 cm. (20.9-in.) torpedoes. Its main defect, namely, the weighting of the head, appears to have been removed; there seems, however, to be no immediate prospect of the introduction of the Davis torpedo in the United States, though its design is based on a sound principle. The reasons for its not being adopted are not known.

(B) ELECTRICALLY CONTROLLED TORPEDOES.—In many places efforts are being directed towards the solution of the problem of controlling a torpedo electrically by means of wireless telegraphy. The most important experiment is that made by the Frenchman Gabet; the torpedo invented by him was fully described on page 126 of *Nauticus* for 1907. The invention has still not proceeded beyond the experimental stage, chiefly because it has not yet been possible to render the control free from disturbance from the enemy, and also because the question of observation at great distances is very difficult.

II.—THE TORPEDO ARMAMENTS OF TORPEDO BOATS, SUBMARINES AND SHIPS.

The principal vessels to carry a torpedo armament are torpedo boats and submarines. It would take us too far if we entered on a detailed consideration of the interesting development of this class of vessel. The article headed "The Torpedo Boat," which appeared in the *Marine Rundschau* for August, 1910, dealt exhaustively with all questions concerning this type of vessel. We therefore refer our readers to this article, and

only briefly summarize its more important contents so far as they come within the scope of this article.

Large Torpedo Boats.

GERMANY.—The large torpedo boat is the result of the natural development of the torpedo vessel, properly so called, whose *raison d'être* is solely to attack the enemy with the torpedo, this development having been necessary to enable her to operate at greater distances. The high speed, seagoing qualities and endurance are in accordance with the offensive idea determining the character of the boats, as is also the powerful torpedo armament consisting of at least three or four tubes. The gun is a subsidiary weapon in the case of the large torpedo boats.

Torpedo Boat Destroyers.

GREAT BRITAIN, FRANCE, AND UNITED STATES.—The destroyers of the British, French, and United States navies, owing to the considerable strengthening of their gun armament as compared with their torpedo armament, are rather to be considered as torepdo boats designed for engaging similar hostile boats than as intended for purely offensive enterprises, that is to say, for attacks against capital ships.

These destroyers have, as a rule, only two tubes, and only recently has a tendency to a change appeared in their employment, and in a few cases also in their armament, a tendency which will cause these types to approximate to the large torpedo boat, to which they are very similar in all other respects. For example, the United States have recently introduced an armament with several twin tubes, that is, an arrangement of two tubes alongside one another turning on one pivot. The two tubes are probably pointed in opposite directions, as this arrangement has the advantage that it saves having to swing the loaded tube right round from one side to the other, in order to fire in the opposite direction, as may be suddenly necessary at night.

At present, moreover, in other navies the destroyer is charged with duties which cannot be regarded as its real object. In many cases it is employed as a cruiser rather than as a torpedo boat. The United States and French papers refer to the employment of destroyers as scouts or for forming a protective ring when steaming at night. French technical periodicals also speak of the employment of destroyers for mine-laying, and state that the experiments carried out have been very successful. They have also demanded that the destroyers should be equipped for mine-sweeping. These are tasks, which, owing to the high demands they impose on the training of the personnel in peace, are bound to affect the interests of the torpedo and divert the boats from their proper duties, whether we regard them as torpedo boats or as destroyers.

Second Class Destroyers and Torpedo Boats.

The second class destroyers (coastal destroyers) and the various small torpedo boats of Great Britain, France, Austria-Hungary, and Italy, are about on a level with the destroyers as regards the value of their torpedo armaments. Inferior seagoing qualities, endurance and speed, indicate, however, that they are intended rather for local coast defence. Their torpedo armament enables them to inflict as much damage as could be effected by a destroyer on any hostile ship which ventures within their sphere of action. The small cost of their construction allows of their being built in large numbers.

All other countries—Japan and recently also Russia—continue to build destroyers only.

Submarines.

The strength of the torpedo armament of submarines varies from two to seven tubes. The possibility of their employment in more extensive offensive operations depends on their seagoing qualities, endurance and speed. Their development was thoroughly discussed in 1910.

THE TORPEDO ARMAMENT OF SHIPS.

Battleships.

(A) GREAT BRITAIN.—In Great Britain only broadside tubes were at first installed as the torpedo armament of battleships, but later on, when the difficulties from the point of view of construction and technical science had been overcome, stern tubes were also fitted, commencing with the "Lord Nelson." The bow tube has not been adopted, at first because of the danger in ramming; later, for constructive reasons, and also on account of the great ballistic difficulties. The number of broadside tubes has varied from one to two on each side. The "Lord Nelson" class and the "Dreadnought" have two pairs of broadside tubes, the "Bellerophon" class, the "St. Vincent" class and the "Neptune" have only one pair. It appears that all new battleships will have one pair of broadside tubes and a stern tube, and that the growing importance of the weapon only finds expression in a considerable increase in the number of torpedoes. With one pair the bearing of the tubes is on the beam; with two pairs the bearing of the forward pair appears to be slightly before the beam and that of the after pair slightly abaft the beam.

(B) THE UNITED STATES.—In the United States, as has already been pointed out, for a long period very little was done to further the development of the torpedo, and but little interest was taken in this weapon on account of the very unfavourable firing results. The slow progress made with the improvement of the 53 cm. (20.9-in.) torpedo, which was commenced comparatively early, and the little confidence which it aroused, were

probably due to the same causes. As a result, according to an article entitled "The Needs of the Navy," in the year 1908 only seven of the sixteen battleships of the Atlantic Fleet were able to have a torpedo armament, as the 53 cm. (20.9-in.) armament which they were supposed to have, could not be completed. Even now, the older battleships, up to, and including the "Wisconsin," have no torpedo armament. A few ships have one above-water tube. A 53 cm. (20.9-in.) armament was subsequently installed in the later ships, up to the "Rhode Island" class. The ships have no bow or stern tubes; the number of broadside tubes is either four or two. In the "Dreadnoughts," from the "Delaware" to the "Arkansas," only two tubes, the bearing of which is probably 15° before the beam, have been installed. The "Texas" class will be the first to again have four tubes.

(C) FRANCE.—In France, also, no great value appears to have been hitherto attached to the torpedo armament of the battleship. It is only recently that the absence of any attempt to follow in the course of foreign progress has been the subject of complaint. Up to and including the "Danton" class, all ships have had one pair of broadside tubes only. The "Jean Bart" is the first ship to have two pairs, but only of 45 cm. (17.7-in.) calibre.

(D) JAPAN.—Japan follows the example of England.

(E) ITALY.—Italy, who gave the battleships of the "Regina Margherita" class four tubes, has reduced the number to two in the case of the "Regina Elena." The armament of the latest ships is also stated to consist of two tubes only. A few papers speak of a stern tube in addition.

(F) AUSTRIA-HUNGARY.—The procedure in Austria-Hungary has been somewhat the same as in Italy. The "Radetsky" class have three tubes.

(G) RUSSIA.—Russia, who in the "Imperator Pavel" class increased the number of tubes from two to five, consisting apparently of one bow and four broadside tubes, is said to have decided on four broadside tubes for the "Gangut" class.

(H) GERMANY.—Germany, who has always given her battleships the strongest torpedo armaments of any nation, keeps to the same number of tubes in her latest ships, that is, six: four broadside, one bow and one stern.

Armoured Cruisers.

Large protected cruisers and armoured cruisers are generally provided with two submerged broadside tubes and one stern tube; in Germany they also have a bow tube. In Great Britain only are large cruisers equipped with four submerged broadside tubes in addition to a stern tube, in accordance with the view that these ships have more frequent opportunities than the battleship for using the torpedo.

Small Cruisers.

The German, United States, and British small cruisers, except the smaller British type, which has above-water tubes, have two submerged broadside tubes. Of the British, the "Dartmouth" and later ships have the 53 cm. (20.9-in.) calibre torpedo. Some of the small cruisers of the other naval Powers still have above-water tubes, as have also the British scouts.

III.—THE EMPLOYMENT OF, AND THE PROSPECTS OF SUCCESS WITH, THE MODERN TORPEDO[1]

FIRING AT SHORT RANGES WITH THE MAXIMUM SPEED OF THE TORPEDO.—Firing at short ranges, as has already been mentioned at the commencement of this article, is mainly carried out during night attacks by torpedo boats, and daylight attacks by submarines. The torpedo has an increase of speed to place to its credit, and therefore considerably improved prospects of hitting. Against this, the increase in the speed of ships scarcely comes into consideration, as it is compensated for, as far as the prospects of the torpedo hitting are concerned, by the greater length of ships. For the success of night attacks by torpedo boats, as well as of day attacks by submarines, surprise is an essential condition, so that the maximum speed of the enemy hardly needs to be reckoned on. It may, therefore, be said that the prospects of success in such attacks have improved, in any case against battleships, the speeds of which have not increased much in recent years as compared with those of torpedoes.

FIRING AT LONG RANGES.—In discussing torpedo attack by day it has been pointed out that firing at long ranges comes into consideration chiefly for daylight actions between squadrons, and therefore, above all, for the torpedoes of battleships.

PROSPECTS OF HITTING SINGLE TARGETS.—The effect of mistakes in aiming, that is, of mistakes in estimating the speed of the enemy and the angle of intersection, increases with the time during which the torpedo is running and therefore with the range. In modern fleet actions, the ranges for which have considerably increased, the prospects of hitting individual ships are very small. In the following numerical statement of the errors to be expected in comparison with the conditions of five or six years ago an average torpedo speed of 30 knots is assumed.

1.—Mistakes in Estimating the Speed.

Errors due to mistakes in estimating the speed of the target increase in proportion to the range, and are now almost double what they were under the conditions which prevailed five years

[1] The lateral deviation of torpedoes, which increases with longer ranges, has been left out of account in these discussions, as it is of little importance in comparison with the misses due to errors of calculation. It is just as likely to act favourably as unfavourably.

ago. A target against which, with the miscalculation assumed, 100 per cent. of hits is to be expected would now have to be 800 metres (875 yards) long.

TABLE I.

Distance of the Target on the Torpedo reaching it.	Period during which the Torpedo is running.	Errors in metres with an angle of intersection of 90° and a mistake of 2 knots in calculating the speed of the Target.
Metres.	Seconds.	Metres.
1,000 (1,094 yards)	66	66 (72 yards)
2,000 (2,187 „)	133	133 (144 „)
3,000 (3,281 „)	200	200 (219 „)
4,000 (4,374 „)	266	266 (291 „)
5,000 (5,468 „)	333	333 (364 „)
6,000 (6,562 „)	400	400 (437 „)

2.—Mistakes in Estimating the Angle of Intersection.

The following tables are drawn up under the assumption that an incorrect angle of intersection of 90° was taken which differed from the correct angle by 20°, this therefore being 110° or 70°. In Table IIA the speed of the target has been taken as 12 knots, and in Table IIB, 18 knots.

TABLE IIA[1] (SPEED OF THE TARGET, 12 KNOTS).

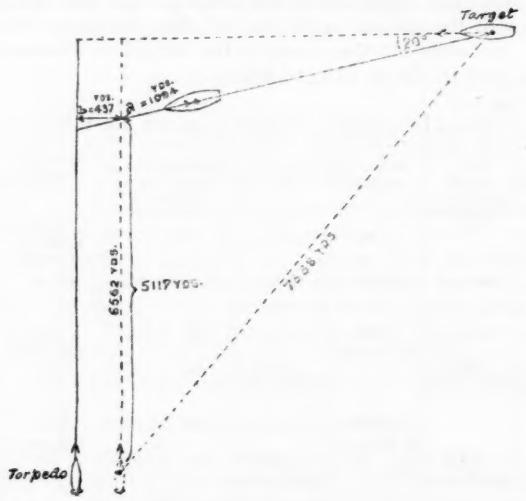
Actual distance of the target at moment of firing the torpedo.	Range with an angle of intersection of 90°.	Range with an angle of intersection of:		Running time of torpedo up to this point of intersection.		The course of the target is therefore crossed by the torpedo.	
		a 110°.	*b* 70°.			*a* In front of centre of the target.	*b* Behind the centre of the target.
Metres.	Metres.	Metres.	Metres.	*a* Secs.	*b* Secs.	Metres.	Metres.
—	—	850 (929 yds.)	—	57	—	87 (95 yds.)	—
1075 (1176 yds.)	1000 (1094 yds.)	—	1,150 (1,258 yds.)	—	77	—	31 (34 yds.)
—	—	1,700 (1,859 yds.)	—	113	—	175 (191 yds.)	—
2150 (2351 yds.)	2,000 (2,187 yds.)	—	2,300 (2,515 yds.)	—	153	—	62 (68 yds.)
—	—	2,550 (2,789 yds.)	—	170	—	262 (286 yds.)	—
3450 (3773 yds.)	3,000 (3,281 yds.)	—	3,450 (3,773 yds.)	—	230	—	93 (102 yds.)

[1] From *Nauticus*, 1905.

TABLE IIB (SPEED OF TARGET, 18 KNOTS).

Actual distance of the target at moment of firing the torpedo.	Range with an angle of intersection of 90°.	Range with an angle of intersection of:		Running time of torpedo up to this point of intersection.		The course of the target is therefore crossed by the torpedo.	
		a 110°.	*b* 70°.			*a* In front of centre of the target	*b* Behind the centre of the target.
Metres	Metres.	Metres.	Metres.	*a* Secs.	*b* Secs.	Metres	Metres
—	—	3,130 (3,423 yds.)	—	208	—	660 (722 yds.)	—
4,640 (5,074 yds.)	4,000 (4,374 yds.)	—	4,875 (5,331 yds.)	—	325	—	390 (426 yds.)
—	—	3,900 (4,265 yds.)	—	260	—	850 (930 yds.)	—
5,870 (6,419 yds.)	5,000 (5,468 yds.)	—	6,080 (6,649 yds.)	—	405	—	430 (470 yds.)
—	—	4,680 (5,118 yds.)	—	312	—	1,000 (1,094 yds.)	—
7,030 (7,688 yds.)	6,000 (6,562 yds.)	—	7,280 (7,961 yds.)	—	485	—	570 (623 yds.)

The amount of error, with the assumption of an angle of intersection 20° too small, has, in the case of the longest ranges, increased about 3.8 times, and with the assumption of an angle



of intersection 208 too large, 6.1 times. A single target would have to be 1,570 metres (1717 yards) long in order to ensure 100 per cent of hits with mistakes within the assumed limits in estimating the angle of intersection.

Consequently in such circumstances, the prospects of hitting an individual ship have become very small in comparison with those formerly prevailing.

Influence of the Great Length of Ships as regards Single Targets.

If miscalculations of speed and course within the above limits are assumed, and the most unfavourable case (20° too small an angle of intersection and 2 knots too high a speed)—is taken, then in order to ensure 100 per cent. of hits the length of the target must be $2(a + \frac{b}{\cos 20})$, where "a" represents the amount given in the last main column in Table II, and "b" the amount of the error due to the incorrect estimate of the speed (Table I). As the percentage of hits diminishes in equal ratio with the length of the target, we get the following formula for calculating it:—

$$\frac{\text{length of the ship}}{2(a + \frac{b}{\cos 20^\circ})} = \frac{x}{100} \quad x = \frac{\text{length of the ship} \times 100}{2(a + \frac{b}{\cos 20^\circ})}$$

By inserting the figures from Tables I and IIA we get, for a ship 125 metres (410 feet) long at a distance of 1,000 metres (1,094 yards), a 40 per cent. chance of hitting. By taking the figures of Tables I and IIB, in the case of a ship 150 metres (492 feet) long at a distance of 4,000 metres (4,374 yards), we only get an 8 per cent. chance, and in that of a ship 170 metres (558 feet) long at a distance of 6,000 metres (6,562 yards), only a 5.8 per cent. chance.

If a British statement that the extreme range for a night attack by torpedo boats against ships is about 1,000 metres (1,094 yards) is accepted, then, at this range and under the assumptions of Tables I and IIA, the chance of hitting, in a night attack, on a ship 170 metres (558 feet) long, is about 54 per cent. as compared with 40 per cent. in the case of a ship 125 metres (410 feet) long.

The chances of hitting in an attack on a squadron of ships proceeding in close order are different. In firing at a hostile line in which the ships' lengths are to the distances between the bow of one ship and the stern of the preceding ship approximately as 1 :2, the chance of hitting would probably be roughly 33 per cent, assuming that the torpedoes are fired at the centre of the line and that errors in aim and in the running of the torpedo are not sufficiently great for any to pass in front of or behind the whole line. According to this superficial calculation, with any desired torpedo speed, subject to the limitations here given, 33 per cent of hits may, therefore, always be expected in an atttack on a line of ships.

Influence of the Greater Length when the Target is a Line of Ships.

The increase in the probability of hitting with ships of greater length in line, assuming a line of six ships, each 125 metres (410 feet), 150 metres (492 feet) or 170 metres (558 feet) long and 300 or 400 metres (328 or 437 yards) apart, is shown in the following table:—

A Formation.	B Total length of 6 ships (metres.)	C Interval between the ships' (metres.	D Total length of the formation (metres.)	E Ratio of hid.	F Percentage of hits.
HOSTILE SHIPS EACH 125 METRES (410 FEET) LONG.					
Line Ahead ..	750 (822 yds.)	300 (328 yds.)	2,250 (2,460 yds.)	1:3	33.3
		400 (437 yds.)	2,750 (3,007 yds.)	1:3.7	27.0
HOSTILE SHIPS EACH 150 METRES (492 FEET) LONG.					
Line Ahead ..	900 (984 yds.)	300 (329 yds.)	2,400 (2,625 yds.)	1:2.7	37
		400 (437 yds.)	2,900 (3,171 yds.)	1:3.2	31.2
HOSTILE SHIPS EACH 170 METRES (558 FEET) LONG.					
Line Ahead ..	1,020 (1,115 yds.)	300 (328 yds.)	2,520 (2,756 yds.)	1:2.5	40.4
		430 (437 yds.)	3,020 (3,303 yds.)	1:3	33.8

It is therefore necessary in the case of a line consisting of the latest ships to increase the intervals to 400 metres (437 yards), if it is not desired to make the chances of hitting greater than with a line of older ships 300 metres (328 yards) apart.

Protection against the Torpedo.

In the article entitled "The Development of Under-water Protection" the struggle between the torpedo and under-water protection has been studied in detail. We may here only refer to the noteworthy fact that, after an interval of over 10 years, Germany has again introduced torpedo net protection for her new large ships. This policy follows that of France, Italy, and most other countries which had for a time given up

net protection. Great Britain, Japan, and Russia have always fitted them.

NET-CUTTING APPARATUS.—The contest between the net and the torpedo has also quietly gone on. Only very occasionally does any information regarding it become public. At the commencement of 1911 one paper reported that a new invention, the so-called "cutter," was being tested in England. This net-cutting arrangement is not, as the name might lead one to suppose, similar to the former shearing or cutting apparatus, but consists of an explosive charge placed in front of the head of the torpedo; this explodes on the torpedo striking the net and so produces and opening. The report does not give any information as to the reliability of the invention in actual use.

CONCLUDING REMARKS.

Any general prophecies regarding the further development of the torpedo would be that, since the range has in some cases already increased to about 9,000 metres (9,843 yards), future progress will be specially concerned with the short range speed, the maintenance of the direct course at long ranges, and perhaps with the increase of the explosive effect.

Already there seems to be no doubt that the torpedo is on the point of taking its place beside the gun as a weapon for long range actions.

Its influence on the result of modern fleet actions appears to be already assured; this influence will continue to increase, and the time may come when the torpedo will be the principal weapon in naval battles.

THE DEVELOPMENT OF UNDER-WATER PROTECTION.

[Translated from *Nauticus*, 1911, and published by permission.]

THE means of protection against the two principal weapons of modern naval warfare, the shell and the torpedo, have passed through very dissimilar stages of development. As regards guns and armour, a competition, with a definite purpose in view, is proceeding between the gunmakers on the one side and the naval constructors and armour manufacturers on the other; guns and armour are improving in constant and intimate relation to each other; they are continually being tested against each other, and as a result of these tests they make progress towards a clearly defined goal.

But in the case of the means for under-water offence and defence the conditions are entirely different. The weapons for offence have, it is true, developed along natural lines, but until a few years ago no attempt had been made to develop the means of defence in a systematic way.

The history of under-water protection for ships may be divided into two main periods, the second of which dates from the events at the end of the year 1904, or rather from the time when these events were brought to light as a result of the study of the Russo-Japanese War.

Now, a transition of this sort, from one period of development to another, is not unusual, but in most cases it is the result of a change of views, whereas, in the case in question, the change was one in the methods of development. Viewed from the standpoint of to-day, the question of under-water protection had been neglected in all navies during the earlier period, and even now its position cannot be regarded as satisfactory. It was only in the second period that methodical development commenced, that the relation between the offensive weapon and the means of protection against it was tested by experiment as well as by theory, and that both weapon and means of protection were developed along systematic lines.

Unfortunately at the moment that this change occurred—and in a great measure owing to its occurrence—secrecy began to be observed regarding these matters in all the leading navies. Endeavours to maintain secrecy on this subject are peculiarly effective, because it is easy to conceal the type of under-water protection of a completed ship, and so the secret is never divulged. Up to the present there is practically no authentic information available on this point regarding any ship built in the later period, though the dimensions, disposition of guns, armour, etc., in all completed ships have been public property for a long time past.

Consequently, just at the moment when the development of under-water protection is increasing in interest, we are placed in the disagreeable position of being dependent on information, which is scanty and frequently unreliable. The only course open to us is, therefore, to sift the information available, and, by the aid of theoretical writings in which the subject is discussed, to discover at least the main lines along which development is proceeding.

Development Before the Russo-Japanese War.

In the earlier period, there seems to have been no clear conception of the effect of mines or torpedoes. This may seem strange, but it is, nevertheless, incontestable; the explanation lies in the great difficulty of obtaining a realistic representation of their effect; it will be shown later what a large number of tests, and consequently what a large expenditure of money, are necessary for this purpose. This vagueness existed not only as regards effect, for there was just as much uncertainty concerning the tactical employment of the torpedo, whether fired from a ship, a torpedo boat, or a submarine; nor was there any definite teaching as to the rôle which mines would play in a future war.

This general uncertainty as to the characteristic features of the weapon led to a wide divergence of opinions. On the one hand, it was argued that the large battleship was almost obsolete, since it could no longer hold its own against a torpedo fired by a torpedo boat or submarine; on the other hand, it was contended that the torpedo and the mine were rather weapons of opportunity. The former view found some advocates in every navy, but only in France did it attain any real importance; in all other countries the second view predominated, and it was this view that governed the methods adopted for defence against torpedoes. Great value was everywhere attached to the anti-torpedo boat armament, and in some navies nets were permanently used; comparatively little attention was, however, paid to the actual protection of the ship against a torpedo which might explode in contact with her side in spite of all precautions. All that was done was to make the ship's bottom thoroughly watertight, so as to confine the effects of the explosion to one place; the interior of the vessel was consequently divided by transverse bulkheads into a number of large compartments, and had, besides, special outer cellular divisions formed by the double bottom and the wing passages. This appeared to be all that was possible.

The above mode of construction has been adhered to, without much alteration in essentials, for many years; for purposes of comparison, sections of British battleships belonging to a comparatively long period are given below, the year in which they were launched being stated in each case; the styles of construction are obviously similar, so far as the under-

water protection is concerned; the longitudinal bulkheads are in each case the same; only the coal space varies.

Certain differences are, of course, recognizable in the form of these watertight compartments. While in many navies the doors of the watertight transverse bulkheads below water were retained, in others, especially in the German, the opinion was strongly maintained that the partition bulkheads between the large hold spaces should have no doors whatever, on the assumption—which was certainly a correct one—that only by so doing could absolute security be obtained against the chance of a door being open at a critical moment.

FIG. 1.
ROYAL SOVEREIGN (1891).

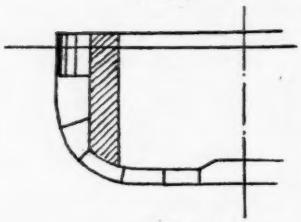


FIG. 2.
DUNCAN (1901).

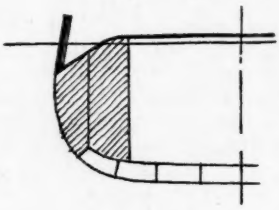


FIG. 3.
KING EDWARD VII. (1908).

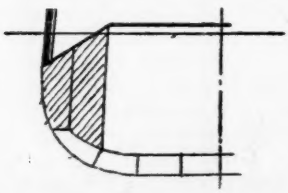
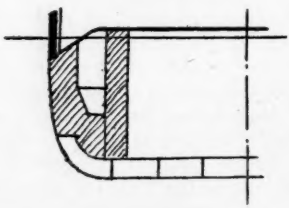


FIG. 4.
LORD NELSON (1906)



Even during this period attempts were occasionally made to develop and strengthen the form of under-water protection. In France, at the instigation of Bertin who had worked incessantly at the problem of improving the means of under-water protection, an isolated attempt was made in the "Henri IV."—an experimental ship in which so many departures from the traditional lines of development were made; a blasting experiment (which will be discussed in greater detail later on) was carried out against a caisson, and the ship was given an increased internal protection, the general arrangement of which is shown in Sketch 5. The ship, however, remained the only one of its kind in the French Navy.

The Russians carried out a similar idea to a somewhat greater extent in the "Tsarevitch" (Sketch 6) and in the ships of the "Borodino" class. A strengthened inner bulkhead

40 mm. (1.6 ins.) thick and about 2 m. 6.6 ft.) distant from the outer skin was employed over a great part of the ship's length. This plan gave rise to a good deal of discussion, but it was not put into practice in any other navies. With these exceptions no departures were made from the traditional system.

Influence of the Russo-Japanese War.

This state of things underwent a great change as the result of the Russo-Japanese War. A clear conception was now obtained of the rôle played by submarine weapons in war. It would be beyond the scope of this paper to examine in detail the effects produced by mines and torpedoes during this war; full information on this subject will be found in *Nauticus*, 1905 and 1907. We shall content ourselves with giving a short summary of what may be called the general result, *i.e.*, the conclusions drawn and the opinions formed by naval authorities as a result of the experiences of this war.

FIG. 5.
HENRI IV.

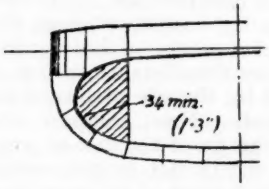
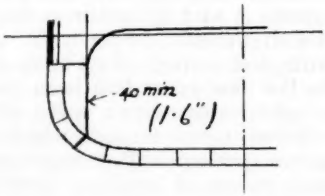


FIG. 6.
TSAREVITCH.



It had been demonstrated that the torpedo was capable of being employed tactically and, although the effects of single torpedoes do not appear to have been very serious, it was recognized that the Japanese used torpedoes with smaller charges, perhaps only 36 kgs. (79.4 lbs.), than those employed in other navies. It had been shown that the mine was an extremely serviceable weapon in the peculiar circumstances of naval engagements near the coast, and in certain cases its effect had exceeded all expectations; more than once, large battleships had been sunk in a moment by mines; and although such achievements are said to have been due, in some cases, to the combined action of several mines, or to accidental secondary explosions in the magazines, nevertheless, such considerations do not in any way diminish the importance of the results.

The importance of under-water means of attack was on the whole clearly demonstrated. From the point of view of the offensive, it was seen that, although secondary to gunfire, it must yet be considered as a weapon of great value; considered from the point of view of the defensive, the conclusion was inevitable that the protection employed for large ships, up to

that time, had been inadequate. It was clear that the disparity already exhibited between the means of attack and the means of protection would tend to increase still more, if the system of protection hitherto in vogue was to be retained; for, on the one hand, it was to be expected that, as a result of the war, there would be a rapid increase in the power of the mines and torpedoes, while on the other hand—again as a result of the war—there would be an increase in the displacement of the battleship and consequently an enhanced need for under-water protection.

Improvement in Offensive Weapons since the War.

First of all, let us consider the improvement in offensive weapons. Here again, we will refrain from going into details, but will content ourselves with a short survey of the new state of affairs. The torpedo has been improved by the increase of its calibre, by the use of heated air and better materials of construction, as well as by a number of structural improvements, which have led in all navies to increased accuracy of aim, greater speed, run and charge. As an example, it may be mentioned that the new English 21-inch torpedo has a range of over 7,000 yards and a speed of 31 knots over this distance (the Hardcastle torpedo is said to attain a range of 9,843 yards), whereas the 18-inch torpedo formerly in use had a range of only 3,281 yards, and a speed of 23 to 24 knots over this distance, which in the last few years had been increased by the use of heated air to 5,468 yards, with a speed of 28 knots. Now, compare this with the 21-inch torpedo which has a charge of 249 lbs. of gun-cotton—perhaps rather more—or with the 18-inch torpedo which has a charge of 205 lbs. How will the charges of the torpedoes (probably amounting to only 79 lbs.) used by the Japanese in the war compare with the above figures? (For further details on this subject see the article in this volume of *Nauticus*—"The Position of the Torpedo in 1911.[1]")

The "shell-torpedo" of the American Davis, appears to be yet another form of under-water weapon capable of further development; it cannot indeed be foreseen at present what course this development will take, but, the idea of causing the explosion to take place inside the ship does not appear to be entirely without prospects of success.

The increase in the displacement and speed of the torpedo-boat keeps pace with this development of the torpedo. In 1904 the highest figures reached were 500 tons and 28 to 30 knots; to-day we have already reached 1,000 tons and 35 knots. A corresponding increase in the size of submarines has been recorded every year, in full detail, in *Nauticus*.

Perhaps, however, the greatest advance which has been made is in the employment of mines. The advance consists, not so much in an increase in the size of the mine itself, as in the fact that special mining vessels have been introduced into

[1] See page 368.

all navies (in some cases these vessels have been built specially for the purpose, in others, old cruisers have been reconstructed); and that the sowing of mines from these vessels is being practised in peace to a far greater extent than formerly. In a future war, therefore, a still more extensive use of mines will have to be reckoned with. The vessels sow the uncontrolled mines—*i.e.*, contact mines—which are moored automatically and take up a position at a certain depth some yards below the surface of the water. They are detonated by contact with a passing vessel, damaging her sides, especially forward, or in exceptional cases they may act against the bottom of a ship. The charges of these mines are in all cases less than 220 lbs. of guncotton. Besides these uncontrolled mines there are floating mines—contact mines floating on the surface—and ground-mines, *i.e.*, observation mines, some of them, perhaps, requiring considerably larger charges.

Another feature of the development which has taken place is, as mentioned above, the enhanced need for protection caused by the increased displacement of battleships.

Influence of the Increase in Displacement.

It had been proved in the war that, in some circumstances, a battleship constructed on the old system might in a moment fall a victim to a mine or torpedo. This discovery was especially serious owing to the tendency to concentrate the entire fighting strength of a fleet in a smaller number of large ships. Indeed, the consideration of this point played a prominent part in the discussions for and against large displacements; stress is continually being laid by the opponents of large displacements on the fact that too much should not be staked on one venture, since the entire fighting strength invested in one battleship may be destroyed by a well-placed under-water hit. But the development of battleships has gone on in spite of these objections; the large battleship has triumphed everywhere, but it is evident from what has already been said that it requires, even more than its predecessors, as effective a system of under-water protection as it is possible to provide. As will be explained at greater length further on in this article, if it is true that the size of a ship increases the necessity of effective under-water protection, it is equally true that it is easier to provide such protection for a large ship than for a small one.

After the importance of under-water protection had been abundantly demonstrated by the Russo-Japanese war, the discussions on the subject took a more practical turn. Every endeavour was made to retrieve the neglect of former years, and to ensure that the improvement of the means of protection should progress hand in hand with the development of the means of offence. The first step was to determine the effect of mines and torpedoes of various sizes and designs.

The natural course would have been to utilize the results of the war for this purpose; very little of the required informa-

tion was, however, available, for the charges used by the Japanese in their torpedoes and mines were not known, and the " more interesting cases," where really serious damage had been done, had resulted in sending the objects attacked to the bottom of the sea. It was, therefore, necessary to institute a regular series of tests in order to ascertain the effect of torpedoes and mines.

Ascertaining the Effects of the Torpedo.

The first investigations naturally took the form of theoretical calculations and laboratory experiments, or of simple blasting trials under water, with small charges of explosive. Calculations and experiments of this nature were carried out in Germany, chiefly by Dr. Bichel, Engineer Dr. Blochmann and Naval Constructor Neubeck, as well as in France and America—in the latter country chiefly by the well-known Naval Constructor Hovgaard. These experiments undoubtedly provided much valuable information as to the nature of under-water explosions and the opinions generally held on this subject have undergone important modifications; that, however, may be described as the limit, for the present—and possibly for a long time to come—of the information obtainable in this way. It has been clearly demonstrated that methods of this sort offer little prospect of obtaining data suitable as a basis for mathematical calculations from which to determine the strains that a ship's frame will be able to withstand. The truth of this statement becomes obvious when one considers the nature of the injuries which can nowadays be inflicted on the under-water portions of ships.

The detonation of a submerged charge of explosive, in open water, immediately produces a pressure which radiates from the centre in all directions with great speed, decreasing rapidly as it spreads; this is followed by the expansion of the gas, which drives the water before it, acting not as a static pressure but as a shock, principally directed upwards, unless the explosion takes place at a considerable distance below the surface. The energy of this shock decreases rapidly in proportion to its distance from the point of explosion.

In the above case these processes described are, to some extent in accordance with known laws and may be subjects for calculation. When, however, a ship is struck by a mine or torpedo, a new factor is introduced, because the explosion does not take place in open water but on the outer skin of the ship, and the phenomena which have to be considered are, therefore, totally different.

As the charge detonates, or immediately afterwards, the explosion rends the outer skin of the ship to a greater or less extent (it may here be observed that it is impossible to make the outer skin strong enough to prevent this; a rent will always be made); part of the liberated gas rushes into the interior of the ship through the gap thus formed, because the air inside the gap offers less resistance to the gas than does the water out-

side; the gas then acts against the frames which oppose its passage partly by static pressure, partly by the shock energy produced by the body of gas expanding with such immense velocity. The destructive effect of the splintered fragments of the outer skin and other parts of the framework has, again, to be considered as a third factor. The total effect on the internal framework of the ship (and that is the chief point) depends, therefore, in the first place on the rapidity with which the rent in the outer skin is formed, for the longer this process takes, the more energy will have been expended by the resistance of the water above and on either side, before the gas is afforded an entry into the interior of the ship. The size, and the shape of the rent must also be considered as factors not less important than the duration of the explosion; for the shape of the hole determines to some extent the nature of the shock resulting from the expansion of the gas, and the effect of the static pressure of the gas introduced into the ship will be influenced in no small degree by the size of the space in which it can expand freely behind the outer skin. Finally, the damage caused by splinters resulting from the explosion is, of course, entirely dependent on the material and structure of the ship's frames, especially those of the outer skin.

These are factors which it is not possible to determine by simply detonating large or small masses of explosives under water; indeed, it is obvious that they can only be very imperfectly ascertained by experiments on small models; the only really practical method of investigating these questions is by carrying out experiments against ships, or against caissons having the same dimensions and system of construction as the parts of the ship which they are supposed to represent.

Explosive Experiments.

Experiments of this nature have been made in various navies. As is to be expected, they have been kept rigidly secret, and in no case have sufficient particulars leaked out to enable reliable conclusions to be drawn; for this purpose one would require to have tolerably accurate information, in each case, as to the amount of explosive used. The following is a *resumé* of the most important facts which have been made public.

As already mentioned, an experiment was carried out in France as early as 1899 against a caisson representing a portion of the "Henri IV." with her internal protection as shown in Sketch 5. It is said that two large holes were made in the armoured inner wall by the explosion of 100 kgs. (220 lbs.) of guncotton.

To come to more recent times, in 1907 explosive experiments were resumed on a large scale at Lorient with the "Caisson Mirabeau," which was built on the model of the battleships of this class (see Sketch 7). The target was experimented with at various times and was repaired in the intervals. On one occasion the detonation of the torpedo head, charged with 100

kgs. (220 lbs.) of guncotton, is stated to have torn a hole of 2 sq. m. (21.5 square feet) in the protective bulkhead which was 45 mm. (1.8 in.) thick. It is said that this experiment proved that the material of the bulkhead was too brittle and that the methods of rivetting required to be improved.

In 1906 an experiment was made in the United States on a caisson, which is said to have been sunk by the explosion. The dimensions were given as: length 4 m. (13.1 ft.), breadth 4 m. (13.1 ft.), and draught 5 m. (16.4 ft.). Further experiments are said to have been carried out with this caisson, without any definite results becoming known.

Later on, further torpedo experiments were carried out against the armoured coast defence ship "Florida," in which a surprisingly small effect appears to have been produced by the explosive. It appears that only the compartment struck was filled with water, and, except for the list which resulted, the fighting capacity of the "Florida" was not reduced. It must be assumed that the torpedo, of which no data are given, had only a small charge. It is worth mentioning that in this case, a departure was made from the customary method of fastening the explosive to the target, and the torpedo was fired at the ship from a distance of 150 m. (164 yards) by means of a wire arrangement. These trials were followed in 1910 by an experiment against the old armoured ship "Puritan," with a view to determining the effect of the explosion against thick side armour. Further exhaustive experiments against caissons have since been undertaken in America in order to investigate the effects of the Davis shell-torpedo. In one of these experiments, of which details have been published, the special construction of this torpedo showed itself well suited for its purpose; the shell was fired, as intended, on contact; it penetrated four bulkheads 20 mm. (0.8-in.) thick and then travelled a considerable distance in the water. In this experiment the projectile was not loaded.

In Italy an experiment was carried out on the old armoured ship "Morosini" (11,000 tons displacement). Details as to the internal construction of the ship and the method of carrying out the experiment are not reliable; the ship capsized, so the damage must, at any rate, have been considerable.

No exact details have become public of a Russian experiment carried out in 1906.

Although the results of these experiments—and perhaps of some others—are not known in detail, it is possible, from a study of the under-water protection actually possessed by the most recently built ships, to draw some indirect conclusions as to the views formed on this subject by the naval authorities in various countries as a result of experiments which have been carried out.

Information as to these protective arrangements is, no doubt, very meagre and should for the most part be accepted with reserve, but at any rate some of it may be taken as probably correct.

Under-Water Protection in Modern Ships.

The British battleships built since the "Dreadnought" have a strengthened internal bulkhead at some distance from the outer skin similar to that in the "Tsarevitch" and the ships of the "Borodino" class, although the upper connecting portion is quite different. As to the two factors which might serve as a basis for deductions, namely, the distance from the outer skin and the thickness of the plates, nothing has become known; but it appears that the bulkhead has been gradually improved in the successors of the "Dreadnought." Of the French battleships, the torpedo protection of the "Danton" class is best known, and is shown in Fig. 7. These vessels have also an interior bulkhead, comparatively close to the ship's side, and curving in a marked degree at the upper and lower parts till it meets the outer skin. The object of this method of construction can only be conjectured; perhaps it has been designed in connection with some elastic means of protection. Nothing is known of the other French battleships.

The United States have not introduced a strengthened internal bulkhead in the "Delaware" class, but only several thin longitudinals, of which the furthest is a long distance from

FIG 7
DANTON

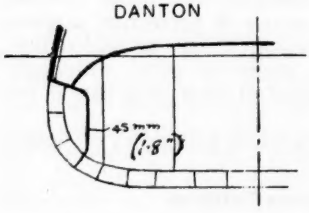
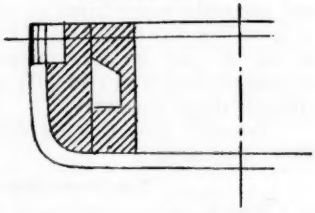


FIG. 8.
DELAWARE.



the outer skin; there are besides, as a means of protection, considerable coal spaces between these longitudinal bulkheads (Sketch 8). It is not quite certain, though it may be considered as highly probable from the reports in various American papers, that in the more recent battleships one of these longitudinals is strengthened and forms a protective bulkhead.

The Brazilian ships of the "Minas Geraes" type have on either side an internal longitudinal bulkhead 38 mm. (1.5 in.) thick at some yards distance from the outer skin.

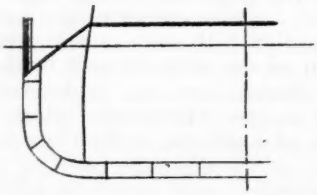
The Argentine battleships "Moreno" and "Rivadavia" have also a similar bulkhead 25 mm. (1 in.) thick; they are said to have besides, in conjunction with this strengthened longitudinal bulkhead, an inner bottom of 19 mm. (0.7) in. thickness, which is said to be 4 m. (13 ft.) from the outer bottom.

The new Russian ships of the "Gangoot" type are remarkable for having no protective bulkhead, but only an ordinary longitudinal bulkhead (Sketch 9).

Nothing definite has become known of the other ships of the new era.

Consequently, although the particulars available are no doubt meagre, it is clearly established that the plan occasionally adopted by the French and Russians, even before 1904, of employing a strengthened longitudinal bulkhead in the interior of the ship over the greater part of her length, has gained almost universal acceptance. In addition, coal protection is certainly employed to a great extent, for it must be admitted that, although not expressly mentioned, coal is stowed up to the protective bulkheads; it is natural to use coal for this purpose as it undoubtedly affords good protection and, in any case, it has got to be carried, so that its use does not involve any particular increase in weight.

FIG. 9.



In certain cases the use of a strengthened inner bottom, and possibly some kind of elastic means of protection appears to have been decided on. In conclusion it may be added that, so far as can be ascertained, the value of good watertight compartments is universally considered at least as great, if not greater than formerly.

We will now discuss briefly the main principles of under-water protection.

The Strengthened Protective Bulkhead.

Thickness and distance from the outer skin are essential to resisting power in the protective bulkhead. The thickness generally appears to be from about 25—40 mm. (1 in. to 1.6 in.). This strength does not appear too great when one considers the importance of the task allotted to the bulkhead; for example an increase in thickness of 5 mm. (0.2 in.) in case of a ship like the "Dreadnought" would mean an increase in weight of about 70 tons, which is, after all, not a very serious amount considering the total displacement. One argument against putting too much weight in these bulkheads is that they naturally have their weak places (*e.g.*, doors and other openings) and that the rivetting of the bulkheads, and the whole interior construction of the rest of the ship has to be on a scale corresponding with the thickness of the bulkheads, if they are really to prevent the entry of water into the parts of the ship behind them.

The distance between the outer skin and the bulkhead in the various types of vessel is not known; it may be assumed that it never amounts to less than 2 m. (6.6 ft.). From the point

of view of stability the distance ought certainly, if it can be arranged, to be as large as this; on the other hand there is the question of the loss of space to be considered, and, secondly, the necessity of reducing to the smallest possible limit the volume of water which can enter in order to minimize settling and list, especially the latter, since even a very small list may seriously affect gun-fire.

The introduction of the protective bulkhead may then be considered as a step which has been decided upon in ship construction.

It has already been briefly stated that the new types of vessel (the "Dreadnoughts") not only require under-water protection in a higher degree than their predecessors, but also that their size makes it easier to afford this form of protection.

This is obvious for two reasons. In the first place, the actual size of the watertight compartments is the same in ships of varying displacement, and two vessels damaged by torpedoes would therefore ship about the same amount of water; but that amount would, of course, be a cause of greater danger to the smaller ship. Secondly, given greater displacement, it is naturally easier to afford the additional weight required for improved under-water protection.

Influence of Beam.

In addition to these two points there is another very important factor to be considered. On account of the limited depths of most fairways, all navies have been compelled to keep the draught of their ships at about the same figure and to increase the displacement by adding to the length and beam only. There has consequently been a proportionately great increase in these two dimensions, and the increase in beam is a condition very favourable for under-water protection; it is advantageous in every respect. In the first place, from the point of view of internal structure, it makes it easier to set back the protective bulkhead a good distance from the outer skin, for the space outside the protective bulkhead either cannot be used at all or only with considerable difficulty; even if coal is stowed there its transport will always be a difficult matter, because as few doors as possible are cut in the protective bulkhead. The outer bunkers must therefore be considered of minor value.

Influence of Stability.

Moreover, greater beam gives the ship additional stability; given equal conditions in other respects, stability increases with a power of the beam, which is far more than a third. The increase of stability due to an increase in beam more than counteracts the opposite influence caused by adding to the weight higher up, as for instance by the erection of a number of heavy gun turrets on the upper deck; the "Dreadnoughts" generally possess greater stability than the earlier ships.

This increased stability is very important in two ways for under-water protection. Firstly, in cases when, as a result of some injury, only a few compartments are flooded up to the protective bulkhead, the increased stability diminishes list, the injurious effects of which have already been referred to; or—to put it in another way—assuming the same maximum permissible list, a greater volume of water may be allowed to enter the more stable ship, and so the protective bulkhead can be placed at a greater distance from the outer skin, thus increasing its (the bulkhead's) power of resistance. Secondly, increased stability gives the ship greater security against absolute destruction resulting from injuries inflicted below the waterline in several places, or from the rupture of the protective bulkhead by a torpedo charge considerably heavier than has been allowed for. In such cases it is seldom to be feared that a ship will simply founder in consequence of lateral injuries, but she may capsize or commence to sink owing to a very heavy list causing an influx of water through the upper works. This conclusion is partly drawn from the reports of the Russo-Japanese War, but may also be deduced with certainty from a study of the structure of modern ships. It would therefore be a mistake to endeavour to provide under-water protection on the same lines as in merchant vessels, by means of a large reserve displacement; this method is justified in their case because they are constructed on a totally different system, and what they most need is protection against grounding, *i.e.*, against damage to the bottom, not to the sides, of the ship; to war vessels stability is far more important than is reserve displacement.

It is true that great stability has certain disadvantages, as indeed is inevitable considering the compromises involved in every problem of warship construction. In certain circumstances increased stability causes a heavier and quicker roll. That is the reason why, in the "Dreadnoughts," the increase in dimensions has not always been quite uniformly distributed between length and beam; for example, in Great Britain the principal aim has evidently been to prevent an undue increase in beam, and, instead, to increase the length; the contrary is the case in America, as is shewn by the following table:—

	ENGLAND.		U.S.A.	
	Neptune	*Orion*	*Florida*	*Arkansas*
	m. ft.	m. ft.	m. ft.	m. ft.
Length ...	155.4 (510)	167.6 (550)	155.4 (510)	168.9 (554)
Beam ...	25.9 (85)	27.0 (89)	26.9 (88)	28.4 (93)

It would lead us too far afield to go thoroughly into the advantages and disadvantages of either system. It is sufficient to affirm that apart from the above mentioned differences in detail, almost all the large new ships possess comparatively greater beam and stability than the old ones, and that this is of considerable advantage to under-water protection.

Proposals Not Carried Out.

This exhausts the various methods which are apparently being employed at the present moment to provide under-water protection. But these observations would not be complete if they did not contain a few words about the ideas on the same subject, which have appeared in the technical press, but which have never taken practical form. It is true that the various plans suggested include many worthless and visionary ideas (though there is perhaps some justification for fantastic proposals on a subject regarding which so little is known). But side by side with suggestions which can be detected as worthless and dismissed in a few words, there are the well-considered ideas of serious professional men, ideas which appear worthy of investigation, and which cause one to wonder why they have never been tried.

The first thing that strikes one in considering these suggestions is the manifestly small value which they place on protection of the bottom. When this question was still in its infancy, at the end of 1904, Naval Constructor Neudeck put forward his well-known triple bottom construction (see *Nauticus*, 1905). That this system has apparently not been used, except perhaps in Argentina, may be attributed in the first place to the fact that, generally speaking, the danger to the ship's bottom must be regarded as considerably less than the danger to the sides. Torpedoes only take effect against the sides; as to mines, it may be assumed that floating mines will only damage the sides; and it will only be in exceptional cases that uncontrolled mines will get under the ship's bottom and detonate there. Thus it is really only observation mines which remain as a danger to the bottom; but the importance of mines of this class is declining, and their effect in many cases will be but slight, as they detonate not on the bottom itself, but at some distance from it.

Besides the fact that there is no serious danger to the ship's bottom, it must also be recognized that it would be very difficult to get a really good bottom protection, as effective as the side protection; the reason is that, as has been pointed out more than once, the distance between the protective bulkhead and the outer skin is a most important factor, and, in the case of the bottom, this distance could rarely be made greater than the usual space between the double bottoms, since the draught cannot be increased, while it is impracticable, in view of the internal arrangements of the ship, to have the inner bottom very much higher than at present. Nevertheless, the ordinary height of the double bottom (about 3.9 ft.) appears extremely small from the point of view of protection, as far as can be judged from the experience of the French.

The data available as to the Argentine battleships, which have a strengthened inner bottom 4 m. (13.1 ft.) above the outer bottom, appear to tell against the arguments used above; but it is not yet possible to say whether this figure is correct, or, if it is correct, over how much of the ship this bottom extends.

If it is of any great extent it can only be at very great sacrifice of other advantages.

It is just as rare, in existing war vessels, to find a strengthened outer skin of any great extent as to find a bottom protection. The idea of a strengthened outer skin has been chiefly advocated by Hovgaard, and has since been taken up in various forms by others, who think it chiefly of advantage against the shell-torpedo. It must be granted that against a shell-torpedo it is better to have the protective wall outside; against exploding torpedoes—and it is with these alone that we are concerned at present—it is just the other way. It is true that Hovgaard considers his arrangement as a protection against the exploding torpedo; he mantains that it would be a great advantage to delay the penetration of the outer skin as long as possible, because, within a very short time, a constantly increasing amount of gas makes its way from the point of explosion to the surface of the water, and, therefore, if the rupture of the outer skin can be retarded, only a small amount of gas is left to penetrate into the interior of the ship. He has investigated all the structural difficulties in the way of a thick outer skin and declares that they can be surmounted; he first recommends 50 mm. (2 ins.) as the thickness of the outer skin and later 75 mm. (2.95 ins.) to 100 mm. (3.9 ins.). A great many purely theoretical arguments may be advanced against the proposal. The one argument that could be urged in its favour, namely, that no water at all would penetrate into the ship, will not bear investigation, as it is impossible with a thickness of 100 mm. (3.9 ins.) (or even with a much greater thickness and with the best materials) to attain such rigidity that the outer skin will be absolutely impenetrable by a torpedo head. And, if it is penetrated, it appears very doubtful whether the process would really take so much longer, with a thicker outer skin, that any considerable portion of the explosive gases will have escaped before the rupture is made. And even if a considerable portion of the gas should escape, it would still be an open question whether the influx of water into the compartments could not be limited, without adding so much weight, by making the outer skin of the usual thickness and by having a strengthened inner longitudinal bulkhead, the thickness of which need not be nearly so great as that of a strengthened outer skin. It must be added that, if a thick outer skin is employed, great damage would most probably be caused in the interior of the ship by splintered fragments. Finally, it must be insisted on that the structural difficulties are very great, and have been disposed of by Hovgaard rather too quickly. Whether the above reasons have led to the rejection of this mode of construction we do not know; at all events it has apparently, never yet been adopted in practice.

The same has apparently been the case with the numerous plans for employing elastic means of protection. Splinter nets, buffers, corrugated iron, filling the compartments with elastic

materials or with water, and similar means were continually being proposed when the great development commenced in this sphere of naval construction. With the exception of coal, of which mention has already been made, few or none of them appear to have survived. It must be assumed, therefore, that when put to the test they proved very much less effective than was expected. Perhaps, also, it is not such a simple matter as it sounds to incorporate elastic walls and nets into the structure of a ship.

The same fate has hitherto befallen the proposal to back the outer skin with wooden planks. It is true, as pointed out by Hovgaard, that the experiences of the Russo-Japanese war appear to be in favour of its efficacy, but it will require stronger arguments to counterbalance the disadvantages of wooden planks.

Of the remaining proposals we will only refer briefly to two. The first of these was to relieve the protective bulkhead by making large holes in the walls of the compartments between the outer skin and the protective bulkhead; the incoming gas would escape through these holes and thus lessen the pressure on the protective bulkhead. It is obvious that, in the most favourable circumstances, these holes would in some degree reduce the static pressure, but they can be of no use as a protection against shock, while, from a structural point of view, they might lead to the most serious results if they were at all large and were carried through from the bottom of the hull to the upper deck. The second proposal, which appeared in a technical journal, is to fill the cells adjoining the outer skin with compressed air at such a high pressure that the gas from a detonated charge would not be able to burst in through a hole made in the outer plating, but on the contrary, the air would stream out. The inventor proposed about 17 atm. Apart from the fact that the proposal is impracticable from a constructional point of view, and that it takes no count of shock effect, the inventor appears to have quite overlooked the fact that compressed air would not be needed at all if the sides were to be made so strong as to resist a greater pressure than that of the gas which they are supposed to withstand.

Recapitulation.

In summing up, it may be said that a certain uniformity of opinion has developed on the question of under-water protection; it appears that a strengthened longitudinal bulkhead, at some distance from the outer skin, is generally employed, together with a good system of cellular compartments, and that the increased stability of modern ships is also turned to account.

Time will shew whether a still further development of submarine weapons of attack, perhaps of the shell-torpedo in particular, may not bring about an alteration in the near future.

THE REVOLUTION IN CHINA.

(Up to the end of February, 1912).

The Abdication of the Manchu Dynasty.

ON the 29th January a memorial signed by the 45 high Imperialist officers, urging abdication and the establishment of a Republic, was presented to the Empress-Dowager. This contributed more than anything else to bring about the situation which culminated a fortnight later in the abdication of the Emperor.

Rumours as to the impending abdication were rife in Peking at the beginning of February, and, on 1st February, Yüan Shih-k'ai, fearing trouble from the Imperial Guards and other Manchu organizations, commenced to recall some of his own trusted troops from their stations on the Peking-Hankow railway into Peking.

The alleged intentions of Sun-Yat-Sen were made clear in an interview accorded to the *Times* correspondent in Shanghai on the 4th February. The Acting President declared that the present Provisional Government should continue for one year, after which he would resign in favour of a new Government, appointed by a Representative Assembly, which in the meantime would be elected. The work of restoring order, he said, in the Republican provinces was already making headway. Yün-Nan was tranquil, order in Nanking was maintained, and communication with Ssu-Ch'uan had been re-established. As regards the northern provinces, the Provisional Government were prepared to delegate their authority to Yüan Shih-k'ai.

A meeting of the Nanking Assembly was held on the 5th February to consider the terms put forward by Yüan Shih-k'ai for a solution of the crisis. These were accepted in principle, some slight modifications only being proposed. The terms as modified provide for:—

(1) The Emperor, after his abdication, to be known as the Manchu Emperor.

(2) The Emperor to reside first in the Forbidden City, and afterwards in the Summer Palace, five miles west of Peking, and to be accorded honours such as would be given to a foreign sovereign visiting China, *i.e.*, the Chinese, after his abdication, will show him due courtesy, but not fealty.

(3) The Emperor to receive an annual grant of 4,000,000 taels (£500,000) until the currency has been reformed. It will then be fixed at 4,000,000 dollars (about £400,000).

(4) Imperial bodyguards suitable to his dignity will be allowed, but must be provided and selected by the Republic.

(5) Ancestral sacrifices shall continue as for the Ming Emperors.

(6) All private property, whether belonging to Emperor or Princes shall be respected.

(7) Princes and hereditary nobles shall enjoy their hereditary rank as before.

(8) Pending the completion of arrangements for devising a livelihood for Manchu Bannermen, Manchu pensions shall remain as before.

(9) Eunuchs to be discontinued.

On the 12th February, three momentous edicts were issued. The first fixed a Republic as the form of Government to be adopted, and invested Yüan Shih-k'ai with full powers to organize a provisional Republic and co-operate with the Republican party in negotiating a joint scheme of government for north and south China. The second contained a recital of the terms of treatment for the Imperial family, with the Imperial acceptance. The third ordered that proper measures should be taken for the preservation of peace and exhorted the officials and people to do their duty by the new Government.

The edicts announcing the abdication of the Emperor and the establishment of the Republic were at first received with some dissatisfaction in Shanghai, due mainly to distrust of Yüan Shih-k'ai's intentions. The publication, however, of the Chinese text of the edicts and of a telegram from Yüan Shih-k'ai to Sun-Yat-Sen unequivocally vowing Republican sentiments did much to allay public anxiety.

On the 14th February, Sun-Yat-Sen resigned the Presidency of the Republic, and by the unanimous vote of the Nanking Assembly, Yüan Shih-k'ai was elected President.

Foreign Troops in China.

GREAT BRITAIN.—The 25th and 26th Punjabis arrived at Hong Kong on the 7th and 13th February respectively, and the 24th Hazara Mountain Battery on the 14th February. With these reinforcements, the British troops in China now amount to:—

North China: Detachment R.G.A.; 2nd Somersetshire Light Infantry; 1st Royal Inniskilling Fusiliers; 124th Baluchistan Infantry.

South China: six companies R.G.A.; 24th Hazara Mountain Battery; two companies Royal Engineers; 1st King's Own Yorkshire Light Infantry; 8th Rajputs; 25th Punjabis; 26th Punjabis; 126th Baluchistan Infantry.

There are detachments from the South China Command at Hankow and Canton, and detachments from the North China Command are guarding the railway line from Peking to the vicinity of Tientsin.

The distribution of the International troops along the Peking-Shanhaikuan railway is as under:—

Peking—Yangtsun (N.W. of Tientsin), British; Yangtsun—Peitang (N.E. of Taku), French; Peitang—Tangshan, German; Tangshan to immediately east of Lanchou, American; thence eastward to Shanhaikuan, Japanese.

The Russians guard Tientsin East station.

In consequence of a request from the Commissioner at Wei-Hai-Wei, 100 British infantry from the North China Command were sent thither to preserve order in the leased territory. According to Reuter's correspondent the situation at Wei-Hai-Wei does not appear to be one to cause anxiety. There has been an increase of piracy along the coast and looting, but no anti-foreign movement has been reported. On the 22nd January, however, a party of revolutionaries raided Wei-Hai-Wei city, and forcibly took charge of the *Yamên*, the magistrate fleeing to British territory. Subsequently some 150 revolutionaries were reported to have been killed.

Situation in Mongolia.

In June 1911 the Russian Government addressed a note to China pointing out the imminence of troubles in Mongolia and urging the following:—

1. Non-interference in Mongolia's domestic affairs on the part of the Chinese.
2. China not to levy military contributions on Mongols nor recruit them as soldiers.
3. China to put an end to unjust schemes of colonization under which Mongols were evicted by Chinese settlers.

China, disregarding these warnings, built barracks at Urga, and organized a division of the modern army. The troops mutinied when the Revolution broke out. The most powerful Prince of the outer Mongols—Djassaktuhan, who is closely related to the Chinese Imperial family, declared his independence at the same time.

A message from the *Daily Telegraph* Peking correspondent dated the 23rd February declares, however, that a federation of Mongol Princes—embracing both Inner and Outer Mongolia—has elected Yüan-Shih-k'ai as President of a "Federated Empire" to which they undertake to adhere. This result, the correspondent adds, has been attained by the retention of the titular Emperor at Peking, and henceforward the temporal power of the princes will be thrown into the scale against "the turbulent monks."

Situation in Manchuria.

There have been several collisions between Imperialists and Revolutionaries in Manchuria, *viz.*: in the neighbourhood of Harbin and in the neutral zone north of Kwantung leased territory. In the latter zone the contestants withdrew, after some delay, in consequence of Japanese protests.

Finance, Loans, etc.

On the 31st January it was announced in the Press that negotiations were proceeding for the sale of the China Merchants Steamship Company to the Nippon Yusen Kaisha for 10,000,000 taels (about $1\frac{1}{4}$ millions sterling), and also for the transfer of the Han-Yang Iron works and the Ta-Yeh and Ping-Hsiang coal mines in Hupei to a Chino-Japanese company. The Imperial Foundry at Wakamatsu and the business house of Mitsui, which are at present large creditors in the above concerns, were to be shareholders. Vehement protests have been raised at a meeting of the shareholders of the China Merchants Steamship Company in Shanghai, as it is generally recognized that the companies are being mortgaged to Japan in order to secure a loan for the Republican Government.

On the 5th February it was announced that Messrs. Arnhold, Karberg & Co. were making a loan of £300,000 upon 6 per cent. Chinese Treasury Bonds to the Imperial Government to be taken at 95 and redeemed at par five years hence. The main object of the loan is said to be to alleviate the difficulties of market conditions in Peking, but the Chinese Government at the same time engages itself to order artillery for the total amount of the loan from the Skoda works.

THE WAR IN THE MEDITERRANEAN.

(A) General.

Italy.

ANNEXATION BILL.—Parliament assembled on the 22nd February. A Bill for ratifying the annexation of Tripoli was carried in the Chamber by 431 votes to 38, and was passed unanimously by the Senate on the following day. A message of gratitude from the Chamber to the troops and sailors on active service was adopted amid scenes of great enthusiasm. The preamble of the Annexation Bill states that a war between Italy and Turkey on the subject of Tripoli was inevitable, and that it was declared at such a time, and has been conducted in such a way, as to incur least risk of international complications; it also contends that a solution which allowed Turkey to retain any political domination in Tripoli would only lead to further difficulties.

COST OF THE WAR.—On the 24th February proposals were submitted to the Chamber for the raising of £8,200,000 for the purposes of the war. Of this sum £1,200,000 is for the navy; and £5,600,000 for the army (£3,920,000 for the maintenance of the troops mobilized in Italy and Africa from September to the end of February, and £1,680,000 to replace war material despatched to Tripoli). In addition a sum of £1,400,000 will be required, including £800,000 for further replacement of stores and purchase of animals for the new units recently authorized. Part of the total required is to be obtained from the surpluses of 1911 and 1912 and the remainder is to be distributed over the years 1912 to 1917.

Besides the above-named sums, £424,000 is to be voted in the financial year 1911-12, for harbour works at Tripoli, landing stages at Benghazi, Derna, and Homs, for the civil services in Tripoli, and for telegraph cables from Sicily to Tripoli and Benghazi.

It is estimated that the war is costing £80,000 a day, not including expenditure on the navy.

In June, 1911, there was a surplus of £2,280,000, and this was exhausted by December, 1911, when the current year's financial credit, £1,200,000, began to be used.

The Government can issue Treasury Bills for £12,000,000, and can by law demand another £5,000,000 from the banks of issue at two per cent. rate of interest. There are also several millions invested in foreign securities, e.g., £1,200,000 in British Treasury Bills, etc.

TRANSPORT AND SUPPLY OF THE EXPEDITION.—It appears from official figures [1] that during the period 6th Oct. to 31st Dec., 1911, 55 batches or convoys making a total of 152 steamers sailed for Africa, *viz.*: 50 steamers in 13 convoys during October, 59 steamers in 21 convoys in November, and 43 steamers in 21 convoys in December.

During this period 101,389 troops (including 4,000 officers), 15,000 horses and pack animals, 200 dogs, and 400 guns were embarked for the theatre of war.

The supplies shipped included 12,000 oxen, 7,000 tons of water, 60,000 quintals of flour, 43,000 quintals of hay, 40,000 quintals of firewood, 30,000 quintals of biscuits and preserved meat. The cost of supplies and building

[1] Quoted from *Streffleur's Militärische Zeitschrift*, Feb., 1912.

materials alone was reckoned at £3,164,800, while the chartering of the steamers had cost £540,000 up to the end of the year. The technical stores included 14 aeroplanes, two dirigibles, one kite-balloon, material for 1,000 huts, and 65 miles of barbed wire.

COMMUNICATIONS.—On the 23rd February communication by wireless telegraphy was established between Benghazi and Vittoria in Sicily. The Italians have now got wireless telegraph stations at Benghazi, Tobruk, Derna, Homs, and Tripoli. It is proposed to lay a cable direct from Syracuse to Tripoli.

The landing of the first engine for the railway on the 25th February, was the occasion for great rejoicings. From the description of the landing operations it would appear that Tripoli is very ill-provided with appliances for handling heavy weights; a cruiser's searchlights had to be requisitioned for carrying on the work at night.

Much has been done to improve the sanitary and economic conditions of Tripoli and the neighbourhood. Hospitals and schools have been instituted and extensive harbour works are to be commenced as soon as the weather is less stormy.

It is hoped to complete the railway to Ain Zara in March; meanwhile a regular service of motor cars has been instituted within the defended zone.

HIGHER COMMANDERS.—General Caneva was summoned to Rome to attend a conference prior to the opening of Parliament; he left Tripoli on the 4th February, and returned about the 18th; during his absence the command devolved on General Frugoni. General Gastaldello, chief of the Staff, left for Rome on the 21st February; his duties were temporarily performed by Major-General Salsa, station commandant at Tripoli.

Lieut.-General Camerana, commander of the 13th Division at Ancona, has assumed command of the 1st Division at Ain Zara in place of Lieut.-General Peccori-Giraldi, who has returned to Italy owing to ill health.

DISTRIBUTION AND STRENGTH.—According to the *Marine Rundschau*, the Italian troops of the Expeditionary Force in Italy and Libya in the middle of February numbered 120,000 in round numbers, with about 200 guns. Their distribution was believed to be as follows:—Tripoli and neighbourhood, 60,000 (34 battalions, 8 squadrons, 15 field and 3 foot batteries, besides 10,000 train and medical troops); Homs, 7,000 (6 battalions, 1 squadron, 2 field and 1 foot batteries), Benghazi, 23,000 (18 battalions, 4 squadrons, 5 field and 1 foot batteries); Derna, 22,000 (18 battalions, 1 squadron, 5 field and 1 foot batteries); Tobruk, 7,000 (7 battalions, 2 field and 1 foot batteries). Total combatant units: 83 battalions, 148 squadrons, 29 field batteries, and 7 foot artillery batteries.

Between the 7th and 11th February, a shipload of camel drivers and a second contingent of Askaris, numbering 1,000, from Eritrea disembarked at Tripoli and were inspected by General Frugoni. A native mounted detachment is being raised locally at Tripoli.

CASUALTIES.—Official figures published on the 2nd March gave the list of killed, missing, or died of wounds since the beginning of the war as 37 officers and 822 rank and file.

It is announced that under certain conditions complementary sub-lieutenants, and sub-officers of the Expeditionary Force may be promoted effective sub-lieutenants in the Regular Army without passing any examination as regards the former, and without passing the usual military course at the military school as regards the latter.

Turkey.

THE DARDANELLES.—On the 24th February, on hearing of the departure of some of Admiral Aubry's squadron from Otranto, the Turkish Government notified the Powers that, should an Italian fleet appear off the Dardanelles, Turkey would close the straits with mines, prohibit the passage of neutral shipping, and expel all Italian subjects.

EXPULSION OF ITALIANS.—In consequence of the action of the Italian fleet at Beirut (see "Naval") the Turkish Government ordered the expulsion of Italian subjects at Aleppo, Beirut, and Damascus; the Valis were ordered to allow the Italians concerned a fortnight's grace and to protect them against any popular demonstrations pending their departure.

It will be recollected that up to the present the Ottoman authorities have, with one or two minor exceptions, permitted the large numbers of Italians resident in Turkey to pursue their usual avocations.

MEDICAL MISSIONS.—The 27 members of the Turkish Medical Mission who had been temporarily detained by the Italians (see February JOURNAL, page 256), arrived at Tunis on the 4th February and went on to Sfax whence they were to proceed across the frontier into Tripoli. On the 19th February a British Red Crescent Mission arrived at Sfax, and proceeded by sea on the 21st to El Biban, on the Tripoli coast, near the Tunisian frontier.

COMMUNICATIONS.—The Turks have one telegraph line from Dehibat on the Tunisian border *via* Nabut—Kàsr Yefren—Gharian to Azizia; and one from Sollum, in Egyptian territory, to Sidi Aziz south of Derna.

APPOINTMENTS.—Colonel Neschat Bey, commanding the Turkish forces, has been appointed Major-General.

The remainder of the Kale Sultanie (2nd Class) Redif Division on the Asia Minor shore has now been dismissed, and it is probable that the same step has been taken with the Berat (1st Class) Division in Europe.

According to the *Temps* there are 9,000 to 10,000 Arabs in all under arms around Tripoli, but no doubt the numbers vary considerably from time to time. There seems little doubt that since the war began the Turks have managed to land not only supplies of ammunition, but also war matériel, including guns, these being probably of Q.F. mountain pattern.

The extra Turkish credits demanded for the war now amount to £900,000 sterling.

(B) Land Operations.

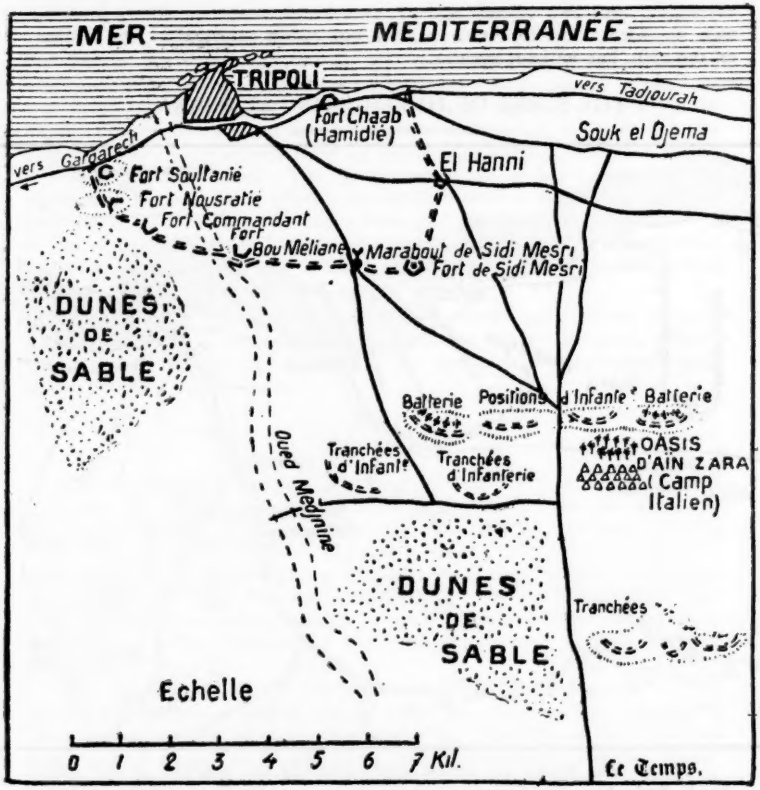
(see maps in February JOURNAL *pp. 252, 253).*

WESTERN THEATRE OF OPERATIONS: *Tripoli.*—On the 6th February an aeroplane reconnaissance established the existence of fresh Turkish entrenchments between Gargaresch and Zanzur; the latter place was still occupied by the enemy.

The Eritrean Askari received their baptism of fire on the 22nd February, in a small skirmish in the direction of Zanzur.

On the 24th February the Italians pushed a reconnaissance about six miles to the south-east of Ain Zara, as far as Bir-el-Turki, a group of wells on the Tarhuna-Tajura road. No opposition was encountered, and only a few mounted scouts of the enemy were seen.

On the 26th February the Italian Press stated that it had been definitely ascertained that the enemy's total strength between the Italian advanced posts and Aziziah did not exceed 12,000 men, and that less than half that number were well armed, the remainder having only old and almost unserviceable rifles. It was also said to be established that a detachment of irregulars, commanded by Turkish officers, was at Zanzur with some machine guns.



This map was drawn by M. de Zorg, the correspondent of the "Temps" with the Turkish forces. It purports to represent the information obtained by Turkish reconnaissances up to the 18th January, 1912.

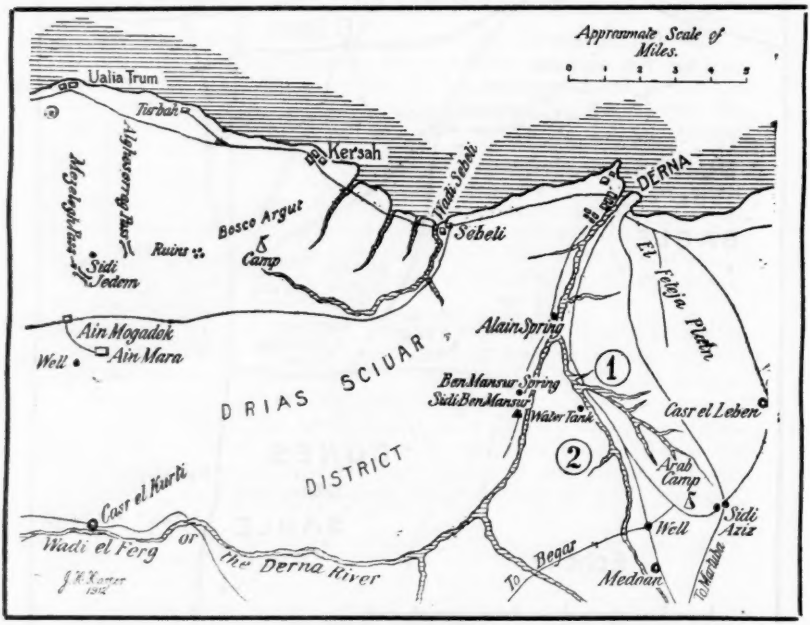
Homs (or Lebda).—On the 27th February the Italians succeeded in occupying the heights of Merkeb, which command from the westward the village of Homs (marked Lebda in map on page 252 of February JOURNAL). On the previous day a transport, escorted by a cruiser, had arrived off Ziliten, some 25 miles to the eastward of Homs, and had succeeded in drawing off a considerable portion of the enemy's troops round Homs, by means of a feigned landing.

The greatest secrecy was adopted in the assembly and departure of the assaulting force. The advance was made in three columns at 6 a.m., and the heights were won at 7.40 a.m.

Between 9.30 a.m. and 2.30 p.m. the enemy, reinforced by considerable numbers from Ziliten, made a series of fierce but unsuccessful attacks on the Italian positions; the bayonet was freely used on both sides, and firing continued until nightfall. The enemy were estimated to have numbered 5,000 men, and their losses to have exceeded 500. The Italian casualties were two officers and 12 men killed, and 11 officers and 90 men wounded. The captured position was again attacked by the Turks on the 28th, but without success.

THE SCENE OF THE FIGHTING AT DERNA.

[*Redrawn from the "Tribuna."*]



Note.—The figure (1) shows approximately the position of the Lombardy Redoubt. The figure (2) marks the point to which the Italian counter attack with the bayonet was pushed.

According to the Press, the object of General Caneva's visit to Rome was to discuss the general military suituation before the opening of Parliament, and he is stated to have said that no decisive action could be expected in Libya, where operations had assumed the character of a colonial war, which might last some considerable time. It is believed that this view of the situation, though not unexpected, had a somewhat depressing effect, and it is possible that the naval operations at Beirut, referred to below, may have been undertaken with the object of proving both to the Italian public and the outside world the determination of the

Government to carry on the campaign with the utmost vigour. The Tripoli correspondent of the *Times* suggests that operations will shortly be undertaken against Zuara. This place serves the Turks as a collecting centre for contraband of war smuggled in over the Tunisian frontier, and as a landing place for vessels running the blockade.

EASTERN THEATRE OF OPERATIONS: *Derna.*—On the night of the 11th-12th February, the Turkish commander, Enver Bey, directed a powerful attack against Derna. A force of 500 Turkish regulars made a demonstration on the right of the Wadi-Derna, against four of the redoubts, while some 2,000 made a concentrated effort against the Lombardy redoubt on the extreme left. The latter attack was further supported by 2,500 men, who were to press the assault into Derna itself. With the aid of machine and field gun fire at short range, and of two bayonet charges by the Alpini, the defenders were able to repulse a series of most determined attacks, which were pressed right up to the wire entanglements, inflicting a loss of about 60 killed. The enemy made use of hand grenades, but apparently without much effect. The Italian official despatches attribute the success of the defence to the warning of the enemy's approach given by the dogs, and to the use of searchlights, which were of the greatest assistance, though they drew a heavy fire on themselves. The Italian loss was three killed and 22 wounded.

TOBRUK.—On the 23rd February, two hostile columns of infantry and cavalry made a reconnaissance against the fort to the south-west of Tobruk, and approached to within 1,000 yards, but were driven back without loss to the garrison.

(C) Naval.

MEDITERRANEAN.—The Italians have extended the theatre of naval operations by attacking two Turkish warships in the port of Beirut on the coast of Syria. At dawn on the 23rd February the armoured cruisers "Giuseppe Garibaldi" and "Volturno" arrived off the port (which is unfortified), and demanded the surrender of the Turkish ships. No response having been received, fire was opened at 9 a.m., and both ships were sunk, according to some accounts by gun fire followed by torpedoes at short range; other accounts say that both vessels were scuttled by their own crews.

The ships sunk were the "Avni Illah" and the "Angora." The former was an old armoured ship of 2,400 tons, built in the Thames in 1869, and remodelled in 1906. Her armament consisted of four six-inch Q.F. Krupp guns, six 12-pounders, ten six-pounders, and two three-pounders. The "Angora" was a torpedo boat of 160 tons, launched in 1905, and designed for a speed of 24 knots.

It is stated by the Italians that these ships were facilitating the passage of contraband of war, but at the time of the incident neither of them had steam up.

Reports as to extensive damage having been caused in the town by the fire from the ships proved to be exaggerated; it appears that two buildings were injured and some 30 Turkish soldiers and sailors killed and wounded. The engagement caused a panic in the town and an arms depôt was plundered by the mob; martial law was, however, proclaimed by the Vali and reinforcements were at once summoned from Damascus; by these means order was soon restored.

On the 26th February the steamship "Rescuer" was captured by the Italians in Sicilian waters; it is alleged that she was carrying 250 tons of war material destined for the Turkish forces in Tripoli.

RED SEA.—The Italian squadron in the Red Sea continued to operate against the Turkish establishments on the Arabian coast. About the 27th January, a Turkish camp at Jebanah, ten miles from Hodeidah, was bombarded. A report that the works of the Franco-Turkish railway company were shelled on this occasion, was officially contradicted in Rome. On the 14th February, Sheikh Said was again bombarded by an Italian vessel. Reports that Italian troops had been landed on the Farsan islands were officially contradicted. About the 24th February the French Messageries steamer "Armand Behic" was allowed by the Italians to enter Hodeidah and to remove some French subjects.

(D) Aeronautics.

DIRIGIBLES.—The new shed for dirigibles was reported on the 24th February to be nearly completed; a transportable dirigible shed has been purchased from a private firm at Berlin, and despatched to Tripoli. It is hoped to have a dirigible ready for use by the beginning of March.

AEROPLANES.—A photograph appearing in the Italian papers shows a bomb, suspended under the aviator's seat, ready for dropping into the enemy's positions. Five monoplanes purchased in France, are said to have been delivered at Constantinople. The problem of their transference to Tripoli has yet to be solved.

Numerous reconnaissances have been carried out in Tripoli. According to the French Press, on February 14th, near Benghazi, an aeroplane, while flying in the direction of Guani-Osman, fell, and was on the point of being attacked by Arab horsemen, when a company of Bersaglieri arrived and extricated the reconnoitring officer.

There are said to be 60 flying machines in all on the north coast of Africa in the theatre of war.

On the 31st January, near Tobruk, Captain Rossi was reconnoitring in a Farman machine with Signor Montu, a volunteer aeronaut, when the latter was slightly wounded by an enemy's rifle bullet. This is believed to be the first instance of an airman being wounded on active service.

(E) Neutrals.

FRANCE AND ITALY.—A good deal of anxiety was caused in France by the action of the Italians in extending their naval operations to the Syrian coast. After the engagement at Beirut (February 23) the French Ambassador at Rome was instructed to ask for information regarding the incident, and to emphasize the importance of French commercial interests in this quarter. Since the publication of the facts the French Press appears to admit that the Italians acted entirely within their rights; nevertheless, they urge that incidents of this sort will merely exasperate Moslem opinion without helping to terminate the war. A French warship, the "Amiral Charnier," was sent to Beirut to protect French interests.

There has also been some fear expressed lest the operations in the Red Sea might endanger French interests. In particular it was alleged, as mentioned above, that the Italians had shelled the works of the Franco-

Turkish railway company at Hodeidah and Ras-el-Ketib, after giving the employés five days' notice. This report was contradicted in Italy, but it was pointed out at the same time that Hodeidah was actually a fortified harbour (there being a small fort at the north of the town which had fired on the Italian vessels on October 2nd); and, further, that the railway works could not be regarded as immune under the Hague Convention; this view appears to be now admitted in Paris.

It has also been alleged in some French papers that France has territorial rights over Sheikh Said (opposite Perim) which has been more than once bombarded by the Italian vessels. This claim does not, however, appear to have been put forward officially.

On the Italian side there has been some irritation visible as to the extent of the trade in contraband of war over the Tripoli-Tunis frontier. The French Press contends that, in practice, this trade is impossible to prevent, as the Tunisian population is strongly in sympathy with the Arabs across the frontier, which runs chiefly through desert land; and that the Italians could most effectively prevent the traffic by occupying Zuara. It is also pointed out that the French are under no obligation to prevent the export of war material to either belligerent.

EGYPT.—Colonel Niazi Bey, one of the leaders in the Constitution Revolution in 1909 has been arrested at Port Said while attempting to pass through Egypt to Cyrenaica and has been sent back to Constantinople.

A protest against the movement of Italian native troops from Eritrea through the Suez Canal has been over-ruled in virtue of the provisions of the 1888 Convention.

PEACE PROSPECTS.—Numerous reports of intended mediation or intervention on the part of the great Powers appeared in the Press towards the end of February. The Italian semi-official Press stated at the beginning of March that Italy would agree to honourable terms provided that her sovereignty in Tripoli and Cyrenaica was fully recognized. On the other hand it was officially announced in Turkey about 24th February that no agreement would be possible on such a basis.

THE SPANISH OPERATIONS IN THE RIFF.[1]

(*Continued from January* JOURNAL, *p.* 121)

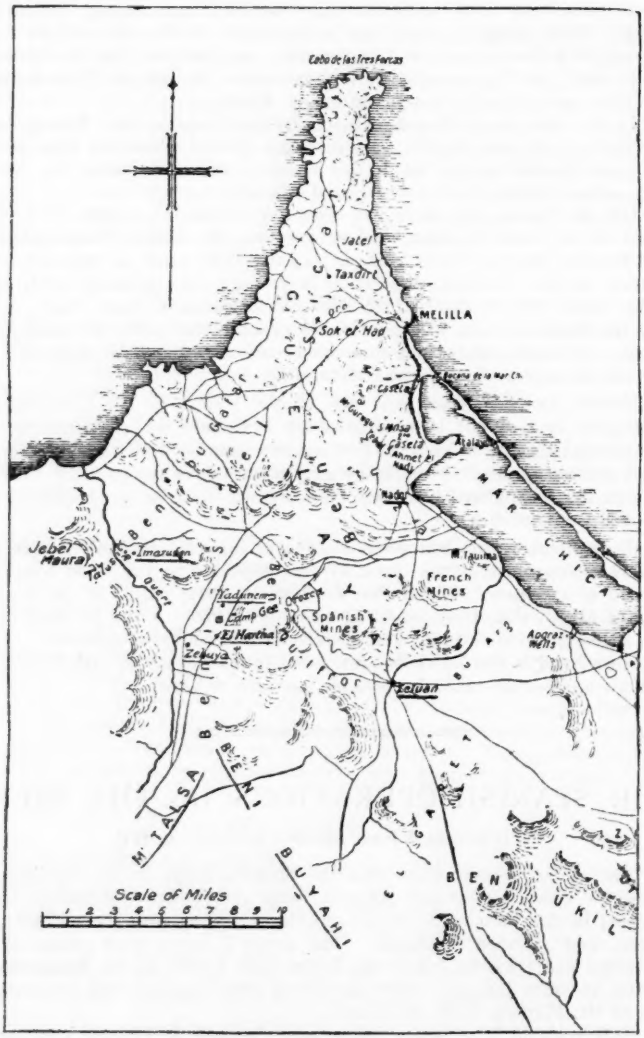
The official reports show that the Spanish losses in the fighting on December 27th (see January JOURNAL, page 121), were even heavier than reported in the January JOURNAL: 12 officers and 83 men were killed; 21 officers and 257 men wounded. The enemy's losses were estimated at 500 killed and 1,200 wounded; 250 Moors were buried by the Spaniards.

On the 18th January, active operations were resumed with the occupation of Mt. Harruit, S.W. of Zeluán.

This position is of some importance, because it entirely commands the wide plains of El Garet and of the Beni-bu-Yagi region, which are well suited for cavalry operations, and because it contains the water supply of all the neighbouring *kabelas*.

The area covered by the operation of January 18th is defined on the north by the positions of Harcha and Taurit-Harrich; on the east by

[1] Condensed from accounts in the *Imparcial*.



[From a map in the Cavalry Journal, January 1910; names in the Quert (Kert) Valley from maps in the Spanish press.]

Note.--Mount Harruit and many of the places referred to cannot be found on any map, but the general position of the scene of operations may be traced with reference to Zeluàn and the plain of El Garet.

Zeluán and Muley Rachid; on the west by Harcha and the heights of Bucherín; and on the south by the mountains called " de Siata," which, forming the arc of an ellipse, extend from the Pass (puerto) of Elisalit to the heights of Titztutin, a distance of about five or six kilometres; facing this chain of hills lies Bucherín. The watershed of the rivers Kert and Zeluán [1] is not far off. To the South of Zeluán is the desert of Garet, a prolongation of the plain—an immense flat expanse, covered with white thorns, and inhabited by a few nomad Beni-bu-Yagi (Yahi).

Between Taurit-Harrich and Bucherín the ground is much broken by both wide and narrow valleys, and commanded by important heights, among the most noteworthy of which are Tiberien and Buxdar. The plain is cut from north to south by the river Zeluán, forming a steep ravine which is very difficult to cross. Two heights also break the surface, namely, Tibaray to the north, and Mt. Harruit to the south. The latter overlooks the celebrated market town Yemáa de Beni-bu-Yagi.

From west to east flow two water-courses, the larger of which is called Melja, to join the river Zeluán.

The soil of all this region, in which the last important operation was carried out, is clay, and during the rainy season traffic is extremely difficult.

The operation was carried out by four columns under Generals Villalon (3,280 infantry, 545 cavalry, 12 guns); Pereira 1,700 infantry, 220 cavalry, four mountain guns); Pacheco (1,600 infantry, 333 cavalry, four guns); Andino (790 cavalry). The above force was under the direct command of General Larrea.

In order to prevent the enemy on the left bank of the Kert from intervening, a fifth column under General Navarro (4,300 infantry, 800 cavalry, and 12 mountain guns), occupied Mount Bucherin, while a detachment under Colonel Serra held Mount Tiberien. General Aldave, the "Captain-General" of Melilla, had his headquarters at Buxdar, where a force of 1,500 men, 276 horse, and four guns was held in reserve. The total force engaged numbered about 20,000 men.

The attack on Mount Harruit was delivered by General Pacheco's column from the east, and General Villalon's from the north, while Pereira's column threatened the enemy's flank and line of retreat from the west, and General Andino's cavalry swept the plain south of Buxdar. Dismayed by this combined movement, and anxious about their line of retreat, the Moors fled after a feeble resistance.

Meanwhile, General Navarro divided his force into two columns (one battery and two battalions each), advanced against Bucherin by the eastern and western slopes of the mountain. The Moors, who crossed the Kert, as had been foreseen, at Zebuya soon became engaged with this column; the Spanish cavalry dismounted and endeavoured to keep them off, but had finally to be withdrawn behind the infantry of the western column; as usual, as soon as this retirement commencement, the Moors were joined by numerous reinforcements and attacked vigorously. The attack was beaten off by the Spanish infantry, which had 30 casualties, and Mount Bucherin was occupied. This ended operations in January.

On the 19th February, three columns (Herrero, Villalon, and Prieto) moved out against a gathering of tribesmen at the foot of Mount Siata. The Moors were surprised and suffered heavy losses. At 2 p.m. the Spanish columns commenced to retire, but the movement had not been completed before nightfall. As usual the tribesmen pressed the retiring

[1] The river Zeluán flows through the town of that name.

columns, and a cavalry charge became necessary in order to hold them off. This was executed by two squadrons of irregulars and one squadron of the Alcantara Regiment under Captain Calvo; the charge is said to have been a brilliant success and to have enabled the retirement to be completed without further molestation. The Spanish losses were two killed and 20 wounded.

The Spanish zone of operations by the end of February, according to various reports, appeared to extend from Zeluán to Punta Negri, with headquarters of the Provisional Division at Zeluán, and of the Melilla Division at Ras el Medua, 20 miles W.S.W. of Melilla.

A railway is to be constructed to Mount Tinidi, via El Jemis, from Melilla.

At the end of February, it was reported that the fanatical El Mizzian, who has taken a leading part in the attacks on the Spaniards in the Melilla Peninsula, had been elected " Sultan " of the Riff tribes.

NAVAL AND MILITARY CALENDAR.

FEBRUARY, 1912.

2nd (Fri.) The Submarine "A 3" sunk with 4 officers and 10 men by a collision with H.M.S. "Hazard."

4th (Sun.) Arrival of the " Medina, " with their Majesties on board, at Spithead, on return from India.

" " Death of Maj.-General Sir H. Scobell, K.C.V.O., C.B., G.O.C. Cape District, at Cape Town.

5th (Mon.) Launch of first-class battleship " España " from Ferrol Arsenal, for Spanish Navy.

6th (Tues.) Fiftieth Anniversary of the capture of Fort Henry by the Federals during War of Secession.

12th (Mon.) Signature of the decree announcing the abdication of the Manchu dynasty

" " Death of General Langlois, the distinguished French writer and soldier.

16th (Fri.) Fiftieth Anniversary of the capture of Fort Donnalson by the Federals.

17th (Sat.) Launch of first-class battleship " Prinz Regent-Luitpold " from Germania Yard, Kiel, for Imperial German Navy.

20th (Tues.) H.M.S. " Indomitable " paid off at Chatham and recommissioned the following day.

23rd (Fri.) H.M.S. " Powerful " arrived at Portsmouth.

" " Ratification by the Italian Chamber of the Decree, annexing Tripoli and Cyrenaica.

" " Two Turkish warships sunk by Italian cruisers at Beyrout.

NAVAL NOTES.

HOME.

The following are the principal appointments which have been made:—

Captains—C. E. Le Mesurier to "Highflyer," and as flag-captain to Rear-Admiral the Hon. Sir A. E. Bethell, K.C.M.G., Commander-in-Chief in East Indies; E. La P. Leatham to "Astrea"; F. A. Poulett to "Talbot"; C. D. Carpendale to "Shannon," and as flag-captain to Rear-Admiral F. C. D. Sturdee, C.V.O., C.M.G.; G. H. Baird to "Indomitable," and as flag-captain to Rear-Admiral Sir G. J. S. Warrender, Bart., K.C.V.O., C.B.; R. Y. Tyrwhitt to "Good Hope," and as flag-captain to Rear-Admiral Sir D. Gamble, K.C.V.O. Commanders—J. U. Farie to "Latona"; C. L. Lambe to "Alacrity"; A. L. Stanley to "Hermione."

The battle-cruiser "Indomitable," late flagship of the First Cruiser Squadron, paid off at Chatham on the 20th ult., and recommissioned the following day for service as flagship of the Second Cruiser Squadron, in place of the first-class cruiser "Shannon," which is to be paid off and recommissioned as flagship of the Fifth Cruiser Squadron, in place of the first-class armoured cruiser "Good Hope," now the flagship of the Sixth Cruiser Squadron in the Mediterranean. Rear-Admiral Sir G. J. S. Warrender, Bart., K.C.V.O., C.B., transferred his flag on the 5th inst., from the "Shannon" to the "Indomitable."

The first-class armoured cruiser "Bacchante" was relieved at Gibraltar on the 27th ult., as the flagship of the Sixth Cruiser Squadron (Mediterranean), by the first-class armoured cruiser "Good Hope," flagship of the Fifth Cruiser Squadron (Atlantic Fleet). The flag of Rear-Admiral Sir D. Gamble, K.C.V.O., Commanding the Sixth Cruiser Squadron, was transferred to the "Good Hope," and the flag of Rear-Admiral F. C. D. Sturdee, C.V.O., C.M.G., was transferred to the "Bacchante," temporarily for the return voyage to England, when Rear-Admiral Sturdee's flag will be transferred to the "Shannon," which is to be the future flagship of the Fifth Cruiser Squadron.

The first-class cruiser "Powerful," recently flagship on the Australian station, arrived at Portsmouth on the 23rd ult., having the remains of the late Duke of Fife on board, which she had conveyed from Alexandria for interment in this country. H.R.H. the Princess Royal and her two daughters also returned to England in the ship, which was brought into harbour and moored at the South Railway Jetty at noon, when the body of the late Duke was landed and conveyed by special train to Windsor. The "Powerful" arrived from Australia at Colombo on the 13th January, where she met the first-class armoured cruiser "Drake," which takes her place as the flagship of Vice-Admiral Sir. G. F. King-Hall, K.C.B., C.V.O., Commander-in-Chief in Australia; the "Drake" left Colombo for her station on the 18th January, the "Powerful" leaving for England on the 20th, calling at Alexandria *en route*.

Health of the Navy.

The annual report of the Health of the Navy for 1910 was recently issued as a Parliamentary Paper.

NAVAL NOTES.

HOME.

The following are the principal appointments which have been made:—

Captains—C. E. Le Mesurier to "Highflyer," and as flag-captain to Rear-Admiral the Hon. Sir A. E. Bethell, K.C.M.G., Commander-in-Chief in East Indies; E. La P. Leatham to "Astrea"; F. A. Poulett to "Talbot"; C. D. Carpendale to "Shannon," and as flag-captain to Rear-Admiral F. C. D. Sturdee, C.V.O., C.M.G.; G. H. Baird to "Indomitable," and as flag-captain to Rear-Admiral Sir G. J. S. Warrender, Bart., K.C.V.O., C.B.; R. Y. Tyrwhitt to "Good Hope," and as flag-captain to Rear-Admiral Sir D. Gamble, K.C.V.O. Commanders—J. U. Farie to "Latona"; C. L. Lambe to "Alacrity"; A. L. Stanley to "Hermione."

The battle-cruiser "Indomitable," late flagship of the First Cruiser Squadron, paid off at Chatham on the 20th ult., and recommissioned the following day for service as flagship of the Second Cruiser Squadron, in place of the first-class cruiser "Shannon," which is to be paid off and recommissioned as flagship of the Fifth Cruiser Squadron, in place of the first-class armoured cruiser "Good Hope," now the flagship of the Sixth Cruiser Squadron in the Mediterranean. Rear-Admiral Sir G. J. S. Warrender, Bart., K.C.V.O., C.B., transferred his flag on the 5th inst., from the "Shannon" to the "Indomitable."

The first-class armoured cruiser "Bacchante" was relieved at Gibraltar on the 27th ult., as the flagship of the Sixth Cruiser Squadron (Mediterranean), by the first-class armoured cruiser "Good Hope," flagship of the Fifth Cruiser Squadron (Atlantic Fleet). The flag of Rear-Admiral Sir D. Gamble, K.C.V.O., Commanding the Sixth Cruiser Squadron, was transferred to the "Good Hope," and the flag of Rear-Admiral F. C. D. Sturdee, C.V.O., C.M.G., was transferred to the "Bacchante," temporarily for the return voyage to England, when Rear-Admiral Sturdee's flag will be transferred to the "Shannon," which is to be the future flagship of the Fifth Cruiser Squadron.

The first-class cruiser "Powerful," recently flagship on the Australian station, arrived at Portsmouth on the 23rd ult., having the remains of the late Duke of Fife on board, which she had conveyed from Alexandria for interment in this country. H.R.H. the Princess Royal and her two daughters also returned to England in the ship, which was brought into harbour and moored at the South Railway Jetty at noon, when the body of the late Duke was landed and conveyed by special train to Windsor. The "Powerful" arrived from Australia at Colombo on the 13th January, where she met the first-class armoured cruiser "Drake," which takes her place as the flagship of Vice-Admiral Sir. G. F. King-Hall, K.C.B., C.V.O., Commander-in-Chief in Australia; the "Drake" left Colombo for her station on the 18th January, the "Powerful" leaving for England on the 20th, calling at Alexandria *en route*.

Health of the Navy.

The annual report of the Health of the Navy for 1910 was recently issued as a Parliamentary Paper.

The returns for the total force for the year 1910 show a continuous improvement in the general health of the fleet as compared with the preceding five years. The case, invaliding, and death ratios all show a decrease, and the average loss of service for each person, although slightly higher than in 1909, compares favourably with the average ratio for five years. In comparison with 1909, the case ratio is slightly higher, but both invalidings and deaths show a decrease.

The total force, corrected for time, in the year 1910 was 113,530, and the total number of cases of disease and injury entered on the sick list was 74,233, which gives a ratio of 653.86 per 1,000, a decrease of 42.51 as compared with the average ratio for the preceding five years.

The number of entries per man for disease and injury was—Home Station, .77; Home Fleet, .57; Atlantic Fleet, .65; Mediterranean, .62; North America and West Indies with Fourth Cruiser Squadron, .64; China, .69; East Indies, 1.06; Australia, .66; Cape of Good Hope, .57; and the Irregular List, .74. For the total force the average was .65, as compared with .64 in 1909.

The average number of men sick daily was 3,124.84, giving a ratio of 27.52 per 1,000, a decrease of 1.11 in comparison with the previous five years. The total number of days' sickness on board and in hospital was 1,140,568, which represents an average loss of service of 10.04 days for each person—a decrease of .4 as compared with the average for the preceding five years.

The ratio per 1,000 of men sick daily on the various stations was—Home Station, 36.58; Home Fleet, 24.11; Atlantic Fleet, 23.2; Mediterranean, 24.9; North America and West Indies with Fourth Cruiser Squadron, 22.7; China, 26.14; East Indies, 26.39; Australia, 25.29; Cape of Good Hope, 22.82; and the Irregular List, 41.8. For the total force the ratio was 27.52. North America and the West Indies shows the lowest sick rate, and, as usual, the Irregular List the highest, but the explanation for this is given under that station.

The total number invalided was 2,004,[1] which gives a ratio per 1,000 of 17.65, a decrease of 3.45 in comparison with the average ratio for the preceding five years. The total number of persons *finally* invalided was 1,747, of whom 66 were invalided after refusing operative treatment. The ratio per 1,000 of *final* invalidings was 15.38, a decrease of 1.08 as compared with the average for the previous 5 years. Of the 2,004 invalidings, 1,860, or 16.38 per 1,000, were for disease, and 144, or 1.26 per 1,000, for injury.

In comparison with the average ratios for the previous five years, the ratio per 1,000 of the force invalided has decreased in the Mediterranean from 30.28 to 13.9; in China, from 21.46 to 15.93; Cape of Good Hope, from 18.7 to 9.52; North America and West Indies with Fourth Cruiser Squadron, from 17.96 to 14.77; Atlantic Fleet, from 22.53 to 20.99; Australia, 14.75 to 13.77; Irregular List, from 18.16 to 15.41; and in the Home Fleet and the Home Station, as compared with the average ratio for the previous two years, from 14.96 to 13.87 and 27.21 to 24.48 respectively.

In the East Indies, however, the ratio has risen, as compared with the five years' average, from 29.61 to 47.

---

[1] This number includes men temporarily invalided from foreign stations, many of whom are again able to join the Active Force. The number finally invalided represents the waste of the service from this cause during the year.

The total number of deaths was 358, giving a ratio of 3.15 per 1,000, a decrease of .35 in comparison with the average ratio for the last five years. Of this number, 241, or 2.12 per 1,000, were for disease, and 117, or 1.03 per 1,000, for injury.

In comparison with the death ratios of the preceding five years, the ratio per 1,000 decreased from 2.9 to 2.19 in the Atlantic Fleet, from 2.96 to 2.63 in North America and West Indies, from 4.15 to 3.29 in Australia, from 2.85 to .95 in the Cape of Good Hope Squadron, and, in comparison with the previous two years' average, from 3.55 to 2.93 on the Home Station, and 3.55 to 2.51 in the Home Fleet.

On the other hand, the Mediterranean shows an increase from 3.45 to 3.55, China from 4 to 6.77, the Irregular List from 4.01 to 4.84, and the East Indies from 7.54 to 14.5, in comparison with the average for the previous five years.

In addition to the usual tabular matter is an appendix, which contains a report on illness occurring while diving, by Fleet-Surgeon R. S. Bernard; two papers on types of *beri-beri* as it occurred in the Persian Gulf Squadron; and notes on several other interesting cases.

The Lost Submarine "A 3."

"A 3" was successfully raised on the 11th inst., and placed in dock the next day. The work of raising her was at first put in the hands of the Anglo-Italian Salvage Company by the Admiralty, whose steamer "Sea Salvage" was engaged for some ten days in the work, but owing to the bad weather and the strength of the under-currents, considerable difficulty was experienced, the hawsers which had been attached to the vessel being carried away more than once. As the result of some disagreement with the Sea Salvage Company, the Admiralty took over the work from the Company, and Yard vessel No. 94 (mooring and salvage lighter) was brought round from Sheerness, and the work of raising the wreck by her means proceeded then as rapidly as the weather permitted.

"A 3" is one of the earlier type of submarines built for the British Navy, which are now practically obsolete for all purposes, except that of coast and harbour defence. The only earlier class was the Holland type, of which but two or three are now left. The "A 3" was launched in 1903, and has a displacement of 204 tons, with an indicated horse-power of 110 submerged, and 450 on the surface, her speed being seven knots below the surface and 12 knots above. She was an improvement on the "A 1," the displacement of which was 180 tons, and the "A 3" carries two torpedo tubes, whereas her predecessor had only one.

Previous Submarine losses.

This is the fourth occasion on which a British submarine has been sunk, attended by deplorable loss of life.

On March 18th, 1904, when some of the earliest submarines were exercising at Spithead, "A 1" was missed at the conclusion of the day's work, and it was afterwards ascertained that she had been struck, when submerged, by the Union-Castle mail steamer "Berwick Castle," and had foundered, two officers and all the crew being drowned. The sunken vessel was later raised.

On June 8th, 1905, "A 8" went down just outside Plymouth breakwater, and only four of her crew of 14 were saved. In this case the submarine foundered without giving any warning to her unfortunate crew; she was running at the time on the surface at ten knots' speed, with

her conning tower open, when suddenly the bow of the vessel dipped heavily, which caused her to ship a large quantity of water through the tower, and before this could be closed she went down. The lieutenant in command, a sub-lieutenant, and two petty officers, who were on deck at the time, were saved; but the remainder of the crew, who were below, were drowned.

On July 14th, 1909, "C 11" was sunk in the North Sea, about midnight, off Cromer, in a collision with the steamer "Eddystone," bound for Hull, which resulted in the loss of 13 of her crew, the lieutenant in command, one other officer and a seamen being the only three saved. On this occasion "C 11" was one of several submarines, running on the surface, which were proceeding with some torpedo-boats and the cruiser "Bonaventure" in line ahead, steering to the south, when the "Eddystone" ran into the flotilla and scattered them. The other submarines manœuvred to avoid the vessel, and in this attempt "C 16" and "C 17" came into collision and were damaged.

The French Navy has lost three submarines in all. On the 6th July, 1905, the "Farfadet" was exercising in the Lake of Biserta, about 500 yards from the arsenal at Sidi-Abdallah, when the order was given to dive. At the moment when the vessel was about to descend, the lieutenant in command perceiving that the skylight of the cupola closed badly attempted to put it right by opening and shutting it with a slam, but before it was completely closed the water began to flood the cupola, and forced the door outwards. The lieutenant and two men were thrown out, as the vessel sank head foremost, and were saved, the remaining 13 men of the crew were drowned.

On the 16th October, 1906, the "Lutin," a sister-vessel to the "Farfadet," was exercising in the harbour of Biserta; after having dived successfully three times, a fourth descent was made, but on reappearing it was noticed she was considerably down by the stern, and after being above water for rather over a minute, she disappeared, and did not rise again. Her crew of two officers and 12 men were lost in her. When the hull was recovered, it was found that there were several leaks in her sides. Both the "Lutin" and the "Farfadet" were small submarines, about the same size as our own "A 3."

On the 26th May, 1910, the "Pluviôse" was exercising off Calais, and on coming to the surface was run into by the Calais-Dover mail boat "Pas-de-Calais" and immediately sank, her crew of two officers and 23 men being lost with her. She was, comparatively speaking, a new vessel, and had a displacement of 400 tons.

Two Russian submarines have been lost: one, the "Dolphin," was sunk on June 20th, 1904, off Cronstadt, through the wash of a passing steamer flooding her through the conning-tower, which was open; ten of her crew went down in her. The other, the "Kambala," was run down in the Black Sea off Sebastopol in 1909 by the battleship "Rotislav," during manœuvres, all hands being lost.

On the 16th April, 1910, the Japanese submarine No. 6 foundered while manœuvring in Hiroshima Bay, and all her crew perished.

On April 26th, 1909, the Italian submarine "Foca," was sunk by an explosion, all her crew perishing.

On the 18th January, 1911, the German submarine "U 3" sank in Kiel harbour, owing to the imperfect closure of the after ventilation pipe. Two officers and a seaman, who were imprisoned in the conning-tower, lost their lives.

FRANCE.

The following are the principal appointments which have been made:—

Rear Admirals—J. L. Le Pord to be Member of the Superior Commission of the Navy; M. J. de la Croix de Castries to be President of the Permanent Committee of Control. Capitaines de Vaisseau—A. C. Ricquer to "Masséna"; C. L. Mornet to "Voltaire"; A. E. Le Troter to command of Corsican Naval Division; L. A. Mottez to be Chief of the Staff to Vice-Admiral Auvert. Capitaines de Frégate—M. A. Chamonard to "Marceau"; C. F. Soulez to "Sagaïe" and Lorient Torpedo Flotilla; L. M. Le Vay to "Lance" and command of Calais-Dunkirk submarine flotilla; A. E. Boissel-Dombreval to "Arbalète" and Ajaccio torpedo flotilla; F. J. Thomas de Closmadeuc to "Fanfare" and command of Oran torpedo flotilla.

Journal Officiel de la République Française.

The Minister of Marine has decided that all large ships of 9,000 tons and upwards are in future to carry two *capitaines de frégate* as seconds in command. This order would appear to be due to the fact that at the time of the explosion on board the "Liberté" both the captain and the second-in-command were on shore on leave and the ship was in charge of a lieutenant.

The Minister of Marine has ordered the dockyard at Rochefort to lay down two submarines, "Q 94" and "Q 95," of a modified "Clorinde" class. The "Clorinde" has a displacement of 410 tons, and is 177 feet long, with a beam of 16 feet, 1,300 I.H.P., giving a surface speed of 15 knots. She is furnished with eight torpedo discharges. They are to be completed by the 1st November, 1913, and the 1st March, 1914, respectively.

By a Ministerial Decree of the 14th January, the two Cruiser Divisions attached to the First Battle Fleet are to be constituted as the First Cruiser or Light Squadron and placed under the command of a vice-admiral. Vice-Admiral Auvert has been appointed to the command of the squadron and hoisted his flag on the 10th ult. on board the first-class armoured cruiser "Waldeck-Rousseau" at Toulon. The squadron is composed as follows:—

1ST DIVISION.

First-class armoured cruisers—"Waldeck-Rousseau" (flagship of Vice-Admiral Commanding), "Edgar-Quinet," "Ernest-Renan."

2ND DIVISION.

First-class armoured cruisers—"Léon-Gambetta" (flagship of Rear-Admiral), "Jules-Ferry," "Victor-Hugo."

The first-class battleship "Charles-Martel," flagship of Rear-Admiral Adam, commanding the 2nd Division of the Third Squadron, having been ordered to be placed in the Reserve at Brest, the Rear-Admiral has transferred his flag to the "Jauréguiberry," which will take her place as flagship; while the "Saint-Louis" was commissioned on the 15th ult. at the same port to take the place of the "Carnot" in the 2nd Division, the latter ship being also placed in the normal reserve of the port.

The Cruiser "Friant" and the Wrecked "Delhi."

The French Minister of Marine has received from the British Government a silver-gilt cup on an ebony plinth, the whole enclosed in

an oak chest, for presentation to the officers of the cruiser "Friant" in recognition of the gallantry displayed by them and by members of the crew on the occasion of the wreck of the "Delhi" off Cape Spartel on December 13th last.

Trials of the "Waldeck-Rousseau."

The new first-class armoured cruiser "Waldeck-Rousseau" has now completed her trials at Toulon, which were interrupted owing to the necessity of commissioning the ship for service before they were fully carried out, the result of the tension existing between France and the Triplice on the Maroccan question. The results were as follows:—

At the ten hours' full-speed trial under forced draught, the engines developed 36,110 I.H.P., making 129.2 revolutions and giving a mean speed of 23.10 knots, with a coal consumption of $2\frac{3}{4}$ cwts. per square metre of grate surface per hour, and a consumption of 1.8 lbs. per indicated horse-power per hour;

At the three hours' full-speed trial at three-fourths power under forced draught, the engines developed 36,000 I.H.P., making 129 revolutions and giving a mean speed of 23.15, with a coal consumption of $3\frac{3}{4}$ cwts. per square metre of grate surface per hour, the consumption per indicated horse power per hour not given;

At the twenty-four hours' trial under natural draught, the engines developed 28,300 I.H.P., giving a mean speed of 21.82, with a coal consumption of $1\frac{1}{2}$ cwt. per square mètre of grate surface per hour, and a consumption of 1.56 lbs. per indicated horse power per hour;

At the coal consumption trial at economical cruising speed, the engines developed 14,038 I.H.P., giving a speed of 18.48 knots, with a coal consumption of 1.5 lbs. per indicated horse power per hour.

During the twenty-four hours' trial under natural draught it was shown that with a coal consumption not exceeding 2 cwts. per square metre of grate surface a speed of 22 knots could easily have been reached without in any way forcing the engines or boilers.

New Submarine Salvage Dock.

The first floating dock for raising submarines was recently launched at St. Nazaire. Its dimensions are as follows:—Length 324 feet; beam, 76 feet; draught of water when empty, 4 feet 3 inches; draught when raising a weight of 1,000 tons, 8 feet. It is built in a horse shoe shape, the machinery being driven by electricity, and it is constructed to raise a weight of 1,000 tons from a depth of 28 fathoms.

The Port of Biserta.

As a result of a Report recently received as to the sanitary condition of Biserta and the neighbourhood, the Minister of Marine has decided to postpone the departure of the men for the ships of the Tunisian Naval Division, and of the additional workmen for the Dockyard at Sidi-Abdallah, and he has also given orders for an addition to be made to the medical staff. Rear-Admiral Amelot, the newly-appointed Commander-in-Chief, has hoisted his flag on board the coast-defence battleship "Henri IV." and taken over the duties from his predecessor Rear-Admiral Lecuve, his Chief of the Staff, Capitaine de Vaisseau Chevallier, assuming the command of the "Henri IV." at the same date.

In the Budget for the present year, provision is made for an expenditure of 7,500,000 francs on Dock No. 2; of 200,000 francs for the clearing out of the tidal basin; an increase in the lodging allowance for all the naval and civil *personnel* of the dockyard at Sidi-Abdallah; an increase in the daily pay of the workmen in the dockyard, in excess of the pay given at the home yards; two weeks' holiday on full pay to all the workmen and a progressive increase in the strength of the *personnel* of the yard.

The importance of the dockyard at Biserta is increasing every month. Two of the battleships of the Second Battle Squadron have been docked at this yard during the last two months for their annual cleaning and refit and two of the "Danton" class of the First Battle Squadron are to come here for the same purpose, instead of refitting at Toulon, thus affording appreciable relief to the latter port.

The two docks here have both been enlarged to take in the new battleships of the "Dreadnought" type, while the two new basins projected are to have a length of 900 feet, at a cost of 9,000,000 francs each. The repairing shops at Sidi-Abdallah, which originally covered an area of 11,000 square metres, now cover 20,000 square metres, and two large store houses, each over 600 feet long and 90 feet in width, are about to be built in close proximity to the machine shops. The power of the central electric-motor machinery, which works the pumps for emptying the dry docks and drives all the machinery of the yard, is to be increased to meet the growing needs, and two millions of francs are to be expended during the next two years on this and other necessary work. It is intended by the Ministry of Marine that the yard shall be capable of undertaking the repairs and supplying all the wants of the squadron of six battleships, five armoured cruisers and twelve destroyers, and it is hoped that during the next two years it will be placed in the position to do so.

Le Yacht La Vie Maritime and *Le Temps*.

ITALY.

The following are the principal promotions and appointments which have been made:—

Vice-Admirals—L. Favarelli to command of Second Squadron; L. Viale to be President of the Superior Council of the Navy; E. Nicastro to be Maritime Prefect at Spezia; A. Garelli to be Maritime Prefect at Venice; M. Amero d'Aste to be Secretary-General to the Minister of Marine, while retaining his position as Vice-President of the Superior Council of the Navy; C. Rocca Rey to be Chief of the General Staff of the Navy. Rear-Admirals—C. Rocca Rey, P. Leonardo-Cattolica, E. Nicastro to Vice-Admiral; H.R.H. the Duke of the Abruzzi to be Inspector-General of Flotillas; A. Pouchain to be Director-General of Artillery.

The Commission, recently appointed by the Minister of Marine, to enquire into the question of compulsory retirement of officers, which was composed of Admiral H.R.H. the Duke of Genoa and Vice-Admirals Bettolo and Grenet, have proposed the retirement of 49 executive officers, 27 engineers, 14 doctors and 12 paymasters. Among the 49 executive officers are two Vice-Admirals, two Rear-Admirals, 13 captains, 10 frigate-captains and 11 corvette-captains. Almost all the officers affected by the measure have accepted it with a good grace and have sent in their own requests to be placed on the retired list.

The Minister of Marine has decided that for the future Taranto is to be in charge of a Commander-in-Chief and raised to the rank of a

Maritime Prefecture; the Maritime Prefect will be a Rear-Admiral, while the Maritime Prefect of Naples will also be a Rear-Admiral, instead of a Vice-Admiral as formerly, when the two ports concerned formed one prefecture.

NEW SHIPS.

The new first-class battleships "Conte-di-Cavour," "Leonardo-da-Vinci" and "Giulio-Cesare" were launched at Spezia and the two last-named at Genoa, on the 10th August, and the 14th and 15th of October, last year, respectively.

These vessels are sister-ships of the "Dreadnought" type and are unique at present, possessing the proud distinction of mounting the most numerous all-big-gun batteries yet put into a modern warship, consisting of thirteen 12-inch guns.

These guns are carried in five turrets, of which two are raised to fire over the fore and aftermost ones and the remaining one amidships between the masts. These three lower gun-houses carry three guns apiece, while the raised positions contain the ordinary twin-mounting. All can be trained on either beam, and five axially ahead or astern, giving them a fire concentration of 11,050 pounds per broadside and 4,250 pounds in the latter directions.

The anti-torpedo battery is carried along the upper deck, and consists, in the "Conte-di-Cavour" of eighteen 4.7-inch guns, while a tertiary armament of fourteen 14-pounders is distributed over the superstructures and turret tops; in the "Leonardo-da-Vinci" and "Giulio-Cesare," the secondary armament will consist of sixteen 6-inch and eighteen 12-pounders. A somewhat novel and original way of spacing the 6-inch and 4.7-inch guns has been adopted in order to provide for a heavy end-on fire. The hull side is deeply recessed in a series of steps fore and aft of the two centre 4.7-inch ports so as to provide accommodation for four guns forward and three aft per broadside.

The armour protection is somewhat light for a ship of her size, but taken in conjunction with the armament and designed speed of 22.5 knots with 24,000 I.S.P., it is probably a good deal more extensive than could have been allotted to a similar ship built elsewhere. The thickness of the belt (water-line) is uncertain, but will doubtless be similar to that of the "Dante-Alighieri" which preceded them, *i.e.*, ten inches amidships tapering to six inches forward and four inches aft. The protective deck is 1.8-inch only. An 8.8-inch strake covers the lower deck side and forms a redoubt, while the battery is protected by 5-inch armour. The heavy gun barbettes and turrets have 9.4-inch armour, and there are two 11-inch conning towers of a novel pattern. Details of these are lacking, but they are believed to be three-storey structures and will probably contain the central gun-control stations. It is also reported that the funnel-bases are to be armoured.

The dimensions of these ships are as follows:—Length, 551 feet six inches; beam, 88 feet seven inches; draught, 27 feet three inches with a displacement of 21,500 tons. They will be provided with three groups of Parsons turbine engines, the two lateral groups acting each on one screw, the central group on two, to give a speed of 22.5 knots; the steam being generated in 20 Blechynden boilers in two groups before and abaft the turbines, while their coal supply is likely to be the same as that of the "Dante Alighieri," which carries a normal of 1,000 and a maximum of 2,500 tons.

The "Conte-di-Cavour" is being built at the Government dockyard at Spezia, and the "Leonardo-da-Vinci" and "Giulio Cesare" at the Orlando and Odero yards, at Leghorn and Genoa, respectively. All three ships were to have been completed by the middle of 1913, but there is likely to be a delay of some six months, owing to the contractors not being able to supply the armour within the time given.

Two new battleships have been commenced at the Government dockyards at Spezia, and Castellamare, to be named the "Andrea Doria" and "Duilio," respectively, while a third is to be laid down at the yard of the Orlando Bros., at Leghorn. It is stated that the displacement of these ships will be over 25,000 tons and that they will carry ten 14-inch guns; the lateral screws will be driven by turbine engines, and the central screw by an internal combustion motor engine.

The "Quarto," the first of the new scouts for the Italian Navy, was launched on the 19th August last at the Venice dockyard, and is now nearly ready for her trials. Her dimensions are as follows:—Length between perpendiculars, 431 feet, length over all, 460 feet three inches; beam, 42 feet eight inches; draught, 13 feet four inches, with a displacement of 3,300 tons. Her armament consists of six 4.7-inch guns, with six 12-pounders and three 18-inch torpedo tubes. She is fitted with four Curtis turbines to develop 22,500 I.S.P., and to give a speed of 29 knots; steam being provided by ten Blechynden boilers, and she is to carry 450 tons of liquid fuel, her only fuel. She is also to be provided with 200 blockade mines. A sister-ship, the "Nino-Bixio" was launched from the Government yard at Castellamare on the 30th of last December, where a third vessel of the type, the "Marsala" is being constructed and will soon be ready to take the water. They will have a crew of 12 officers and 228 men.

Delay in the Manufacture of Armour.

Owing to the delay in the delivery of armour by the Terni works and their inability to manufacture the plates required within the necessary time limit, the Government has thrown open the contract for three lots of armour plating, one for 1,500 tons of armour, and two others for 1,300 tons each. The contract has been obtained by the American Carnegie Steel Company at a cost of 2,132 francs per ton; the other competing firms were the French Schneider and Co., the English Cammell Co., and the Krupp firm, who asked 2,465, 2,675 and 2,700 francs per ton respectively.

The Naval Estimates for 1911-12.

The Naval Estimates for the current financial year (1st July, 1911, to 30th June, 1912) voted last autumn by the Chambers amount to a total of £7,800,000, as against £7,458,426 for the previous year, of which sum £2,341,302 is for new construction. The new Financial law voted by the Chambers allows for an increase of the credits to be extended from 1911 to 1918, so that the future Estimates will probably rise to from £8,800,000 to £9,000,000.

The following are the principal provisions of the new Law:—

1. The programme of 1909 which provided for new constructions an extraordinary credit of £17,000,000 to be distributed between 1910 and 1916 is extended two years to 1918.

2. The annual ordinary credit for new constructions is fixed at £2,400,000, which in eight years amounts to £19,200,000, an increase of £1,600,000.

3. There is further allotted, in addition, to the Minister of Marine, an extraordinary vote of £3,600,000 to cover the existing deficit.

The total increase of the extraordinary expenditure amounts therefore to £5,500,000, to which must be added a further £3,000,000, to be distributed over eight years, which appears in the Ordinary Estimates.

Constitution of the Fleet.

The fleet is for the present constituted as follows:—

First Squadron, commanded by Vice-Admiral Aubry[1] *Commander-in-Chief.*

FIRST DIVISION.

First-class battleships—"Vittorio-Emanuele" (flagship of Vice-Admiral Aubry), "Regina-Elena," "Napoli," "Roma."

SECOND DIVISION.

First-class armoured cruisers—"Pisa" (flagship of Rear-Admiral Presbitero, commanding division), "Amalfi," "San Marco."
Torpedo-Aviso—"Agordat."
Destroyers—"Garibaldino" and three others, with the mine-layer "Partenope" and cistern-ship "Tevere."

Second Squadron, commanded by Vice-Admiral Faravelli.

FIRST DIVISION.

First-class battleships—"Bendetto-Brin" (flagship of Vice-Admiral), "Regina-Margherita," "Saint-Bon," "Emanuele-Filiberto."

SECOND DIVISION.

First-class armoured cruisers—"Garibaldi" (flagship of Rear-Admiral Thaon di Revel, commanding division), "Varese," "Ferraccio," "Marco-Polo."
Torpedo-Aviso—"Coatit," with four destroyers, the mine-layer "Minerva" and the cistern-ship "Eridano."

Third Squadron (Reserve), commanded by Rear-Admiral Borca-Ricci.

First-class battleships—"Re-Umberto" (flagship of Rear-Admiral commanding), "Sicilia," "Sardegna."
Armoured cruiser—"Carlo Alberto."

Destroyer and Submarine flotillas, under the command of Rear-Admiral the Duke of the Abruzzi, Inspector-General of Flotillas.

Armoured cruiser—"Vettor-Pisani" (flagship of Rear-Admiral commanding).
Protected cruiser—"Lombardia" (Depôt-ship), with 29 destroyers, 28 sea-going torpedo boats, 38 torpedo-boats and 9 submarines (two undergoing trials.)

---

[1] Since the above was written Admiral Aubry has died, on his flagship, and Admiral Faravelli has succeeded to the supreme command.

The following ships are in commission but not attached to either of the squadrons :—

Protected cruiser "Puglia," torpedo-aviso "Iride," factory-ship "Vulcano" and the troopships "Bronte," "Sterope," "Citta-di-Milano," "Garigliano."

Revue Maritime, Marine Rundschau, and *Marine Engineer.*

UNITED STATES.

Narrow Escape of U.S. Destroyer "Warrington."

The "Warrington" was one of a destroyer division, which was *en route* from the south for New York, and when off Cape Hatteras, steaming in the teeth of a heavy gale, was run into on the morning of the 28th December last by an unknown vessel, and had her entire stern cut off as clean as with a knife.

The destroyers, five in number, were steaming north, at a speed of from 12 to 14 knots, against a strong gale and heavy sea. It was between the moons—and the night was overcast and very dark. Driving before the storm, with her reefed lower sails "wing and wing" and a smother of foam at her bows, came a large coasting schooner. Her course intersected that of the destroyers at an angle, as far as could be judged, of about 50 degrees. The watch forward, if she had any, must have been asleep, or taking shelter under the weather bulwarks, for he failed to see the many lights of the far-strung line of destroyers, and the sight of them may have been shut off from the man at the wheel by the foresail. Whatever the conditions, the schooner came driving right through the line of destroyers, striking the "Warrington" just abaft her after torpedo tubes, and just ahead of her after water-tight bulkhead. Cleanly, as though it were a keen knife of steel, her stem cut through the destroyer, completely severing 40 feet of her stern from the body, stripping the hull plating, with its framing, clear of the shafting, and leaving the latter protruding aft of the gaping wound in the ship, like a couple of long, trailing tentacles.

Asleep in bunks within the compartment into which the schooner thus rudely intruded, were eight petty officers, of whom four were knocked insensible, and somewhat, though not seriously, injured. Of the other four, two escaped by lifting themselves over the jagged end of the main deck above, and two escaped by a door in the forward bulkhead, dragging the injured men with them just in time to escape the inrushing water.

The water flooded this compartment, and entering through the open door flooded also the compartment ahead up to the water-tight bulkhead. Fortunately, in spite of the heavy sea that was running, this bulkhead held.

It was a critical state of things. A "frail" destroyer, disabled in heavy weather off Cape Hatteras, 150 miles from the nearest dry dock (at Norfolk) with 40 feet of her stern gone and another 50 feet open to the sea.

The wireless sent out its call, however, and brought the revenue cutter "Onondaga" to the rescue. With some difficulty lines were run to her, some of the "Warrington's" crew were transferred, and after a long tow of 48 hours, the staunch little destroyer was brought in through

the Capes, and safely docked at the Navy yard, where a new stern will be built on to her. The "Warrington" was built in 1910 by the New York Shipbuilding Co., and the way she has come through the late trying ordeal to which she was subjected is a high testimony to the excellent constructive work of that yard. Her dimensions are as follows:—Length, 288 feet 8 inches; Beam, 26 feet 3 inches; Mean Draught, 8 feet 2 inches, with a displacement of 742 tons. She is fitted with turbine engines, which develop 12,000 I.S.P., and give a speed of 29.5 knots. Her armament consists of five 50-calibre 3-inch and 2 machine guns.

Scientific American.

Law of Projectile Flight Proved.

In addition to the formal and expected effects on the armour, the firing tests in which the ram "Katahdin" and the old battleship "San Marco" were the targets had a great influence in determining the laws that govern the flight of projectiles. Two of the most important facts demonstrated by this experimental firing, the Chief of Ordnance, U.S.N., says in his annual report, are that a projectile in flight is at all times tangent to the trajectory, and that the penetrative effects of projectiles at battle ranges on modern armour are in accordance with previously calculated data. Some inventors of high explosives have claimed that the axis of a projectile in flight was parallel in flight to its position at the time of leaving the gun and that, therefore, at high angles of fall it would be impossible to penetrate armour. The firing at the "Katahdin" entirely discredited such views.

Army and Navy Journal.

MILITARY NOTES.

BRITISH EMPIRE.

HOME.

APPOINTMENTS.—The following appointments appeared in the *Gazette* of March 5th, dated March 1st:—

General Sir C. W. H. Douglas, G.C.B., from Commanding-in-Chief the Southern Command to be Inspecter-General of the Home Forces, in succession to General Sir J. D. P. French, G.C.B., G.C.V.O., K.C.M.G., Aide-de-Camp General to the King.

Lieut.-General Sir H. L. Smith-Dorrien, K.C.B., D.S.O., Aide-de-Camp General to the King, to be General Officer Commanding-in-Chief Southern Command.

Lieut.-General Sir D. Haig, K.C.I.E., K.C.V.O., C.B., to be General Officer Commanding-in-Chief Aldershot Command.

RANK ON RETIREMENT.—It is announced in Army Orders that an officer who has held an appointment with the local or temporary rank of Brig.-General or Major-General for three years, or who has retired for age

while holding such an appointment, may be granted on retirement, or, in the case of an officer of the Indian Army, on transfer to the unemployed supernumerary list, the honorary rank of Brig.-General or Major-General respectively.

SEPARATION ALLOWANCE FOR TERRITORIALS.—Provision has been made for the extension of the issue of separation allowance, which has hitherto been restricted to N.C.O.'s, to all married privates of the Territorial Force who attend camp for the full period of 15 days.

RIFLES AND S.A. AMMUNITION.—In the course of the Army Debate in the House of Lords on February 21st, Lord Haldane announced that the design of a new clip-loading rifle had been approved, which would, if it fulfilled expectations, be the finest in the world, both in flatness of trajectory and other respects; a number of these rifles would, he added, be manufactured and issued to selected bodies of troops to practice with; if the tests were satisfactory the new rifle would be at once adopted in place of the old one. The new ammunition had, he said, been almost decided on; it would be in a form adapted to an automatic rifle, should one ever be introduced; he indicated, however, that the military authorities were at present, not in favour of the adoption of an automatic rifle.

With regard to existing armament, the extreme height of the trajectory at 800 yards with the Mark VII. ammunition is 8 ft. 9 ins., that is lower by 4 ft. 7 ins. than with the Mark VI., though still 2½ ft. higher than that of the German rifle. Four Divisions of the Expeditionary Force had, Lord Haldane stated, received the new ammunition, the remaining Divisions and the Cavalry Division would receive it almost immediately; it would then be issued to the Special Reserve, and so on througout the Army.

THE ARMY ESTIMATES FOR 1912-13.

The following memorandum of the Secretary of State for War relating to the Army Estimates for 1912-13 was issued on the 27th February as a Parliamentary Paper [Cd. 6064].

Total Estimates.

The Army Estimates for 1912-13 show a total of £27,860,000, as compared with £27,690,000 for 1911-12, an increase of £170,000, which is due, as is shown further on in this memorandum, entirely to the growth of the provision made for aviation services, the inevitable consequence of the extension of the sphere of national defence into a new element. Apart from this increase the provision of the necessary funds for several important services, such as the growth of mechanical transport, additional horses for the cavalry, and reserves of the new cartridge, coming in a year when scarcity of forage increases the charge for that item alone by some £90,000, has been accomplished only by the exercise of the strictest economy in other directions.

Establishment and Strength of the Regular Army.

Additional numbers were provided in 1911-12 to meet the anticipated necessities of infantry regiments in the years about to come when, owing

to past changes in the term of colour service, a double quota of men would leave the ranks for the Reserve in the same year, thus causing abnormal requirements for recruiting and great difficulty in providing the necessary drafts of trained men for the battalions in India. These additional numbers afforded scope for recruiting in advance of requirements, and by this means and by judiciously inducing men to either shorten or prolong their colour service, according to the necessities of the different regiments, much has been done towards the re-establishing the even flow of men through the ranks. The process will require to be steadily continued during the year 1912-13 in the infantry and also in the cavalry, where a somewhat similar condition of things exists.

Recruiting, though still not specially brisk, has improved generally in the course of the past year; but in the case of the Royal Engineers a serious shortage in the number of skilled tradesmen presenting themselves for enlistment has for some time been manifesting itself. The emoluments of the soldier tradesman have not kept pace with the improved rates of wages obtainable in the open market, and it has at last become necessary to revise the pay of the sapper in such a way as to afford the average man a substantial increase. At the same time, to reduce the expense involved and to diminish the number of skilled recruits required, it has been decided to introduce a proportion of men of the pioneer class, that is, handy men of the skilled labourer type, into those Royal Engineer units whose duties in the field do not require that they should be entirely composed of skilled artificers. The new terms for sappers and for pioneers have recently been brought into operation, and I hope that the ranks of the Royal Engineers will before long be full.

Provision has been made for completing the organization of the Signal units of the Royal Engineers during the year. By means of reductions in other directions this will be done without increase of the total establishment of the Royal Engineers.

The introduction of mechanical transport for fourth line transport for ammunition will make a considerable reduction in the Royal Field Artillery personnel required to mobilize the Expeditionary Force and to maintain it in the field. This will eventually enable reductions to be made in the peace establishment of that arm, but until the new personnel of the mechanical transport service (Army Service Corps) has become definitely available, no reduction in the Royal Field Artillery establishment can be made.

Some further addition has been made to the Royal Garrison Artillery establishment in continuation of that made in 1911-12, to provide a margin to cover fluctuations in the strength of garrisons abroad.

Supply of Officers.

During the past year the new buildings at Sandhurst have been occupied and found completely satisfactory. The old buildings have been evacuated and are being taken in hand for modernization. The new buildings accommodate 420 cadets and are full, this number being larger by 60 than the number in residence at any previous time. It is hoped that during 1912 the old buildings will have been sufficiently reconstructed to admit 140 more cadets, and that within two years the Royal Military College will have its full complement of 700 cadets in residence. As the numbers grow, the course of study will be prolonged from two terms (one year) to three terms.

Though it cannot be said that an adequate supply of qualified candidates to fill the enlarged college is definitely assured, the numbers entering for recent examinations have been sufficient to provide competition for the increased numbers of vacancies available, and I hope that the new regulations for cadetships recently published will have the result of stimulating the entries to the required extent.

At Woolwich the full number of cadets is now in residence, the company of Sandhurst cadets temporarily lodged there having been removed; and the course of study will be increased from three terms to four (two years).

The number of University candidates commissioned during the past year was 72, an increase of two over the preceding year's figure. Over 10 per cent. of the officers now entering the Army are in possession of University degrees; and not only do the candidates for commissions continue to improve, but the Universities are working in close and cordial co-operation with the General Staff. I view the establishment of these relations with great satisfaction, and was glad to be able to make an experiment of inviting some of the Universities to send representatives to study the higher work of the Army, both at the Staff College and at manœuvres. The experiment has proved a success, and I hope in time to extend it.

Special Reserve.

The total strength of the Special Reserve on January 1st last was about 1,800 less than a year ago, but I am glad to record that there was an increase of 70 officers. One cause of the fall in strength since the changes of 1908 has been the reduction in the number of re-engagements, due to the lowering of the age limit for service in the Infantry Special Reserve (40, or 42 for ex-soldiers), as compared with the Militia limit of 50 years. The only men in the ranks eligible to re-engage as yet are the ex-Militiamen, and it is satisfactory to note that they have been no less ready to re-engage than in past years.

Active emigration and a good labour market have increased the number of discharges by purchase and have told against recruiting for the Special Reserve as for the Regular Army; but a distinct improvement in this respect is noticeable as compared with a year ago, the strength of this branch having increased continuously since August last, and showing a total gain from that month to February 1st of nearly 3,000.

The number of ex-soldiers who have so far enlisted into the Special Reserve under the new arrangements made last year is smaller than I had hoped; but they are coming in steadily and I see no reason to doubt that within a comparatively short time there will be enough of them to form a very valuable stiffening to the battalions.

Territorial Force.

The only important change in the establishment of the Force is the addition of one more cyclist battalion, to be raised in the Northern Command.

The strength of the Force on February 1st, 1912, was 9,385 officers and 259,092 other ranks, showing a decrease of 304 officers and an increase of 101 other ranks, compared with the figures for the corresponding date in 1911. Although the figures as regards officers are somewhat disappoint-

ing, the decrease in the numbers on the Active List is to some extent made good by an increase of 112 in the Territorial Force Reserve. As regards other ranks, it is satisfactory to note that, whilst the total increase for the past year is only 101, that for the quarter ending December 31st, 1911, amounted to 1,816, and this rate of progress shows signs of being maintained.

The decision to employ regular colonels from the half-pay list as commanders of Mounted and Infantry Brigades and of Divisional Artillery, and regular officers from the active list as Brigade Majors and Staff Captains of Divisional Artillery, has been attended with the best results, and has contributed materially to increased efficiency in the Force. The filling of these appointments by regular officers from the active list will be continued and, in a few special cases where such a course appears desirable, sanction is being given for the appointment of a major of the Royal Artillery as Commander of a Territorial Artillery Brigade.

A feature of the past year's training has been the tendency to concentrate Territorial units in larger camps, where, although the training carried out is still of an elementary nature the administrative services have full scope for carrying out the duties which would fall to their lot in war. But in view of the somewhat remote situation of the principal large areas of land devoted to training purposes, I have thought it desirable to allow General Officers Commanding-in-Chief, when the circumstances of a particular unit in their judgment warrant, considerable latitude in the selection of sites for camps, in order that once in three years training may take place in a more congenial locality.

The figures for attendance at camp were as follows:—For 8 days and less than 15, 1,074 officers, 75,821 other ranks; for 15 days and over, 6,975 officers, 148,282 other ranks.

The musketry returns for the past year show a marked improvement. Out of 293 Yeomanry, Infantry, and Royal Engineer units which perform the full musketry course, 184 qualified 75 per cent. of their strength and over; 77 units qualified between 50 per cent. and 75 per cent. of their strength, and 32 units qualified less than 50 per cent. of their strength, as compared with 126, 105, and 60 units respectively in the previous year. The improvement in the individual results is no less gratifying, 142,435 individuals having qualified in the past year, as against 126,761 in 1910.

The range accommodation for the Force, though by no means yet on a satisfactory footing, has been considerably augmented. The difficulties are not financial, but lie in the inevitable scarcity of suitable areas of open ground in the vicinity of large centres of population. During the past 12 months, 15 open rifle ranges, 20 30-yard ranges, and 50 miniature ranges have been provided, whilst good progress is being made with further important proposals. The new artillery range on Salisbury Plain will be open for practice this year, and a certain number of batteries will also practise at the new range in Northumberland.

Good progress has been made with the provision of equipment for the Force. Amongst other things the re-armament of the horse artillery batteries has been completed, breast collar harness has been substituted for neck collar harness, and a first instalment of intrenching tools and carriers has been supplied to infantry units. The remainder will be supplied during the coming year, and provision is also made for supply of binoculars, and of dial sights and telephone equipment to batteries of artillery.

With a view to meeting the difficulties connected with the provision of horses, more especially during the non-camping period, approval has been given for the purchase and maintenance of a limited number of animals by such County Associations as have been able to frame schemes on a sound financial basis. In some of these schemes the horses are kept in Association stables; in others they are " boarded out " on suitable terms. The large increase made last year in the grants for supply of horses for drills makes it easy for a horse, under favourable local conditions, to " earn " his keep, and more, at drills and camp. The results of these experiments are being carefully watched; they have so far fully justified their introduction, and I hope to see a considerable extension of the system of ownership by Associations.

The number of officers and other ranks who have accepted liability for foreign service are 1,148 and 19,481 respectively, being an increase of 123 and 2,022 compared with the figures of last year. To the two complete units who had previously accepted this liability must now be added the Home Counties Divisional Telegraph Company, Royal Engineers.

I am glad to be able to record that the number of voluntary aid detachments which had been " recognized " was trebled during the past year, and amounted on 1st January, 1912, to 1,258.

The numbers (148 officers and 536 men) who up to the end of December had joined the Territorial Force Reserve instituted last year were small. But of the men leaving the ranks of the Force recently, comparatively few have been discharged on termination of engagement. The larger numbers have enlisted, emigrated, or left for other reasons that would prevent them from joining the Reserve. In view of the large number of engagements terminating in the course of the coming year, I hope that better progress will be made.

Finance.

The introduction of an improved form of financial statement for County Associations for the year 1910-11, and the systematic calculation of the provision required in the shape of reserve funds for future renewals of clothing and equipment, have enabled the financial position of each County Association to be definitely determined. Many Associations, both large and small, in all parts of the country, exhibit substantial surpluses after providing fully for both present and prospective liabilities, a gratifying result which reflects great credit upon the Associations and their officers for the care and forethought which they have devoted to an unfamiliar task.

Taking the Associations as a whole, they required on the 31st March, 1911, reserve funds amounting to £422,000, and their cash assets were sufficient to provide these reserves in full and to leave a net surplus of £41,000 in addition. This may be regarded as establishing the fact that the grants now made to Associations for administrative purposes are adequate for the efficient performance of their present functions; and if in some cases the results are less brilliant, and in a few it has been found necessary to call for special efforts to be made towards recovery of financial equilibrium, I have every hope that those Associations which at the outset adopted methods that have not stood the test of experience will now find themselves able to follow the lead of the more successful, with equally satisfactory results.

The following figures for the initial and capital expenditure on the Force are of interest:—

At the outset, £364,000 was spent in paying off the debts of the Yeomanry and Volunteer units; and £440,000 in redeeming mortgages on their property held by the Public Works Loans Commissioners. Since then, further capital expenditure on ranges, land, and buildings has been definitely approved amounting to £1,300,000, of which sum £780,000 has been actually advanced by the Public Works Loans Commissioners on mortgages repayable by annual instalments in 40 years or less. Of the balance of £520,000, about £200,000 has been paid from Army Votes, and the rest relates to schemes still in course of execution. The Associations also hold leasehold property to the annual value of some £80,000. The total value of the buildings in their hands (apart from lands) is nearly 3 millions.

Plans for some further new buildings are in hand, and efforts are being made, now that the bulk of the new provision has been arranged, to improve those older buildings which are below a reasonable standard of accommodation for either military or social purposes. In London, in particular, it is hoped to make the Duke of York's Headquarters an attractive centre for Territorial Officers and men of all units; and a sum of £28,000 is being spent in additions and improvements to the buildings vacated by the School.

Much has been said in many quarters as to the supposed insufficiency of the present attractions of service in the Force to bring in the necessary recruits, and it has been freely stated that only some substantial extra cash payment to the men, such as an annual bonus of £1 at camping time, or something equivalent, could produce the desired result. I do not hold that view. On the contrary, what I have seen and heard in many parts of the country convinces me that where the true spirit of voluntary patriotic endeavour has been fully developed there is no need to attempt to buy the services of men; and it is where that spirit is less in evidence that the cry goes up that recruits can only be had for money. In many counties the work already done and doing, and the spirit displayed are beyond praise; and in these I find no pessimism about the future of the Force, but a spirit of self-reliance and determination to compel success.

The period now immediately before us is critical on account of the large number of engagements about to expire; but a shrinkage, if it should take place, due to the abnormal influx of recruits in 1908, would be altogether different as an index to the future from a shrinkage due to lack of the normal number of recruits at the present time. For some months past the Force has been increasing in strength. In many counties the strength is over 95 per cent. of the establishment. I believe that those where the success hitherto obtained has been less complete will before long make good their shortage.

As regards payments to the men of the Force, I have been able, in two respects, to make provision towards equalizing the burdens that fall on different individuals. Hitherto the allowance, called Separation Allowance, made to wives and families during the absence of their husbands at camp has been confined to non-commissioned officers, and this rule has told somewhat heavily against the married private who desires to stay for a second week in camp, but would suffer loss of wages by so doing. Separation allowance will therefore in future be issued to all married men who complete the full period at camp.

Another inequality arises from the varying calls made upon the time of men in different places by attendance at musketry, owing to the very different periods of time taken in reaching the ranges. These inequalities cannot be met without full local knowledge and consideration of the circumstances. An additional allowance depending on the mileage will therefore be made to the Associations, in order that they may have at their disposal funds to enable them to make an adequate subsistence allowance to the men according to the necessities of each case.

National Reserve.

Fresh regulations were issued in November last for the National Reserve (formerly known as the Veteran Reserve). This body is primarily a register, kept by the County Associations, of trained officers and soldiers divided into three classes—those fit to join a combatant unit for service in the field, those fit for combatant duty in garrisons or for administrative work, and those honorary members retained on the register for social purposes or for the good influence they are in a position to exert in matters affecting our military organization.

Most exemplary energy has been displayed in many parts of the country in the task of forming this register. On 1st February, 1912, the numbers registered in Great Britain had reached 76,000. An organization for extending the register to Ireland is under consideration.

This Reserve is not intended to become a third-line army, and the individuals composing it undertake no liability to serve when called upon, but it will be of the greatest use in enabling the military authorities, in case of need, to lay hands promptly on the large quantity of valuable trained material that has hitherto been allowed to pass beyond their ken.

Horses.

Recent cavalry manœuvres have brought prominently to notice the large proportion of the horses in the ranks of the cavalry regiments at home which would not be fit, on the outbreak of war, for the very hard work which would at once be demanded of them. A thorough investigation was made during 1911 into the system of horsing the cavalry, as regards peace establishments, mode of supply of remounts and methods of training. As a result it has been found necessary to make a further increase in the numbers of horses maintained in the regiments in peace, and it is in contemplation to introduce a system of collecting remounts and sending each regiment its annual supply in one batch, to be then subjected to a course of systematic and progressive training, instead of sending horses in small numbers throughout the year. Under the new system, when fully established, no horse will be subjected to the strain of manœuvres or put into the ranks on mobilization for war until he has been thoroughly hardened in this way and has reached the age of six years. It is confidently expected that the cost of the new scheme will be to a large extent covered by the saving made on wastage, and the longer average service obtained from the horses.

In pursuance of this scheme 20 horses are added to the peace establishment of each line regiment at home.

I mentioned in my memorandum on the Estimates of the current year that County Associations had encountered various difficulties in the task of organizing the supply of horses to the Regular and Territorial

Forces on and after mobilization. After full investigation, I found the best solution to lie in transferring the responsibility for completing the work to General Officers Commanding-in-Chief, providing them with a small staff of remount officers for the purpose, and placing at their disposal the services of adjutants of the Territorial Force, to inspect and classify a sufficient proportion of horses in each county to provide the required quotas after allowing for casualties and rejections.

This month was the time assigned for the completion of the first classified lists and hereafter the lists will be continuously revised so as to keep touch with the changes in the horse population of the country.

The expansion of mechanical transport in the Army will reduce the number of horses required for the Expeditionary Force to a considerable extent, but unfortunately the corresponding expansion in the civilian world threatens to lead to the disappearance of the 'bus horse, on which we have hitherto mainly relied for artillery purposes.

Mechanical Transport.

During the past year steady progress has been made in the conversion of the third and fourth lines of transport from horse to mechanical transport.

One depôt company and 14 service companies of mechanical transport have already been formed with a nucleus of vehicles, leaving for completion in 1912-13 the four further companies required for the Expeditionary Force. *Pari passu* with the formation of the new mechanical transport companies, horse companies have been reduced so that in the autumn of this year the horse transport establishment will comprise only the exact number of companies required for three Home depôts, seven units abroad, and the forty units still required for the Expeditionary Force. The peace establishment of the mechanical transport companies has been fixed tentatively at eight vehicles (six lorries and two tractors), and it is anticipated that this establishment, in addition to its employment for training and manœuvre purposes, will effect a considerable annual saving in expenditure on hired transport.

Considerable progress has also been made with the registration of lorries for war requirements. A scheme of subsidies for vehicles which comply in certain respects with War Department specifications has been worked out, and will shortly come into force. In the meantime a provisional scheme for the immediate enrolment of lorries of a type approximating as nearly as practicable to Army requirements has been in operation, and under this a considerable number of vehicles have already been registered.

As regards personnel to meet the needs of the Expeditionary Force on mobilization, steps are being taken to enlist civilian drivers, preferably those actually engaged in driving the subsidized vehicles, into the Special Reserve.

Aviation.

Sufficient experience has now been gained in military aviation to warrant advance on less tentative lines; and after careful consideration by the Committee of Imperial Defence, it has been decided to establish at once a joint Army and Navy School of Aviation at which officers of both services shall be taught to fly, before proceeding to the separate

Army and Navy establishments at which they will be exercised in the more specialized requirements of their respective services.

A site for the school has been selected on Salisbury Plain, and the purchase of the necessary land will be completed at the beginning of April. Building, to plans which have been already prepared, will be pressed forward rapidly, and it is hoped at a very early date to have accommodation at the school for officers and men, instructors and mechanics, as well as the necessary sheds for aeroplanes and workshops for their repair and adjustment. Provision has also been made on an extended scale for purchase of aeroplanes and other necessary equipment for the school.

Officers of both services will be employed on the staff of the school, and its expenses (other than cost of land) will be shared between Army and Navy votes.

The Estimates further provide for continuing the experimental and other work of the Army Aircraft factory, for further buildings required for airships, for an addition of personnel to Army establishments for aeroplane work, and for a considerable number of aeroplanes as a first instalment of the equipment of the Field Army.

The total provision for the above services made in these Estimates compares with that made in 1911-12 as follows:—

—	1912-13.	1911-12.
	£	£
Establishment of Army personnel for aeronautical work ...	25,000	20,000
Premiums to officers gaining pilots' certificates	3,000	—
Staff of new school	5,000	—
Aeroplanes, stores, and materials for factory and school	161,000	85,000
Buildings, including Army share of school buildings ...	38,000	26,000
Land for school	90,000	—
	322,000	131,000
Less Admiralty contribution to general expenses of school	14,000	—
	308,000	131,000
Increased provision	177,000	

Armaments.

The re-armament of the Howitzer batteries of the Royal Field Artillery with the new quick-firing howitzer is completed, and issue of the new pattern dial sight to 13-pr. and 18-pr. batteries is proceeding. The time fuzes used by these batteries, which had showed some signs of liability to deterioration from damp, have all been rendered waterproof, and are now satisfactory.

A pattern of one-man range-finder for Horse and Field Artillery has been approved, and provision is in progress.

The manufacture of a new carriage for the Mountain batteries has been commenced.

The issue of the new ammunition with pointed bullet and of re-sighted rifles has been commenced, and the whole of the Expeditionary Force will be equipped at an early date. Increased provision has been made in the Estimates for small-arm ammunition, so as to provide at once ample reserves of the new cartridge.

Investigation into the question of automatic rifles is still proceeding, but no design has yet been produced which can at present be recommended for adoption. I do not consider it advisable to delay the introduction of an improved rifle any longer, in the hope of securing a satisfactory automatic arm. A new pattern of magazine rifle has therefore been worked out, and a number of rifles for extended test by the troops will be put in hand at a very early date.

Trials of a lighter pattern of Maxim gun are in progress, and a new pattern mounting for this gun, for use with cavalry, is under consideration.

The re-armament of the cavalry with the new pattern sword has been completed.

As regards the Territorial Force, all Horse and Field batteries are now in possession of their full complement of guns and howitzers, and dial sights will be supplied as fast as they become available by issue of the new pattern to Regular batteries. Arrangements will be made to provide sights of this type for all practice carried out in the coming year at practice camps, and for the necessary training of the batteries before going to camp.

The present machine-gun carriages of the infantry are being replaced by tripod mountings. Good progress is being made with the provision of these, and a considerable number will be issued in time for this year's training. Provision has been made for completing the supply within the year.

Works Services.

The total amount to be spent on Part I. services during the coming year (£632,600) is slightly greater than the corresponding provision in 1911-12. It will be devoted largely to making substantial progress with the important new services already in hand.

The new barracks at Edinburgh, Lichfield, and Dover are proceeding satisfactorily.

Two of the new Cavalry depôts (Scarborough and Seaforth) and two of the Field Artillery depôts (Woolwich and Athlone) are completed. The others are in hand, but the Newcastle Field Artillery depôt has to await the removal of the Durham Light Infantry depôt to Durham. Progress with this service has been retarded by delays in acquiring the site, but it is hoped to commence building in the coming year.

The provision of new married quarters is proceeding steadily, and as they become available for occupation, improvements and better accommodation are being provided in the older quarters.

The huts occupied by officers in camps such as Bordon and Kildare have been improved, and hut accommodation at musketry camps is being gradually provided so as to permit of units living at the camps and carrying out practice during the winter months.

Electric lighting at Ewshot, Deepcut, and Blackdown is complete, Bordon is very nearly so, and progress is being made at Malta. Tidworth and Bulford will be dealt with during the coming year.

The new artillery range at Ad Fines (Northumberland) has been purchased, and money is taken for the necessary roads, hutting, &c., to be constructed this year.

Abstract of Army Estimates.

The following are the figures for the net Estimates, in the abstract on pages 8, 9 of the "Army Estimates of Effective and Non-Effective Services for the year 1912-13" (Parliamentary Paper 47) :—

Votes. Nos.		Net Estimates.		Increase on Net Estimates.	Decrease on Net Estimates.
		1912-13.	1911-12.		
	I.—Numbers.	Total Numbers.	Total Numbers.	Numbers.	Numbers.
A	Number of Men on the Home and Colonial Establishments of the Army, exclusive of those serving in India ...	186,600	186,400	200	—
	II.—Effective Services.	£	£	£	£
1	Pay, etc., of the Army	8,536,000	8,648,000	—	112,000
2	Medical Establishment: Pay, etc.	436,000	437,000	—	1,000
3	Special Reserve	715,000	742,000	—	27,000
4	Territorial Forces	2,780,000	2,766,000	14,000	—
5	Establishments for Military Education	142,000	147,000	—	5,000
6	Quartering, Transport, and Remounts	1,624,000	1,641,000	—	17,000
7	Supplies and Clothing	4,275,000	4,295,000	—	20,000
8	Ordnance Department Establishments and General Stores	615,000	581,000	34,000	—
9	Armaments, Aviation, and Engineer Stores	1,718,000	1,472,000	246,000	—
10	Works and Buildings	2,602,000	2,591,000	11,000	—
11	Miscellaneous Effective Services	72,000	73,000	—	1,000
12	War Office	440,000	436,000	4,000	—
	Total Effective Services...	23,955,000	23,829,000	309,000	183,000
	III.—Non-Effective Services.				
13	Non-Effective Charges for Officers, etc.	1,843,000	1,808,000	35,000	—
14	Non-Effective Charges for Men, etc.	1,917,000	1,900,000	17,000	—
15	Civil Superannuation, Compensation, and Compassionate Allowances and Gratuities ...	145,000	153,000	—	8,000
	Total Non-Effective Services	3,905,000	3,8 1,000	52,000	8,000
	Total Effective and Non-Effective Services ...	27,860,000	27,690,000	361,000	191,000
				Net Increase...	£170,000

Repayments by Government of India, included as Appropriations in Aid of Army Estimates; other than Stores, etc., issued on Repayment.	1912-13.	1911-12.
	£	£
To meet the Expenditure for Raising and Training Recruits for India	862,000	861,500
For Deferred Pay and Gratuities for Service on the Indian Establishment	65,000	61,000
For Non-Effective Services of the European Army serving in India	1,034,591	1,027,011
	1,961,591	1,949,511
Deduct—Contribution from Army Funds towards Cost of Garrison of Aden and Sea Transport	230,000	230,000
	£1,731,591	£1,719,511

(Signed)

HALDANE OF CLOAN.
J. E. B. SEELY.
H. J. TENNANT.
W. G. NICHOLSON, C.I.G.S.
J. S. EWART, A.G.
H.G. MILES, Q.M.G.
C. F. HADDEN, M.G.O.
E. W. D. WARD, Secretary.

War Office, February 22nd, 1912.

AUSTRALIAN COMMONWEALTH.

WAR RAILWAY COUNCIL.—Regulations were issued in December, 1911, for the formation of a War Railway Council, to consist of the Quartermaster-General, the senior officer of the Engineer and Railway Staff Corps of the Commonwealth railway system and of each State railway system, the consulting military engineer, and two representatives of the naval and military forces. The duties of the War Railway Council are:—

In peace time, to advise the Minister for Defence, generally, on railway matters; to suggest regulations for carrying out movements of troops, method of organizing railway transport officers in war as intermediaries between the railway authorities and the troops, and system of organizing and training railway troops when the development of universal training supplies sufficient personnel whose ordinary employment is railway work; and, finally, to consider such questions as extra sidings, loading platforms, and proposals for unification of gauges.

In war, proceedings of the Council will be recorded as recommendations to the Minister, but will not be binding on the Governments concerned unless accepted by them.

THE ENGINEER AND RAILWAY STAFF CORPS.—Establishments have been published for an Engineer and Railway Staff Corps. Honorary commissions in this corps will be granted to officials of the Commonwealth and State railways on the recommendation of the Governments concerned. Commissioners or general managers will have the rank of colonel, other officers that of lieut.-colonel or major; uniform will be provided for these officers similar to that authorized by the Staff, with a distinctive badge, but its wearing will be optional. The establishment of the corps will be as follows:—

Colonels (Commissioners or General Managers)	14
Lieut.-Colonels or Majors, Railway Staff for:	
(1) Maintenance of existing lines	13
(2) Traffic or transportation	13
(3) Locomotive branch	11
(4) Electrical or other branch	7
Total	—58

CADET TRAINING.—The number of hours to be devoted annually to military training by senior cadets in the Australian Commonwealth has been reduced from 72 to 64. (Defence Act, 1911).

THE REPORT ON THE ROYAL MILITARY COLLEGE OF AUSTRALIA.

The first annual report on the new military college bears the date 17th October, 1911, four months after the opening of the college. It is divided into four parts, containing: (1) notes on the military colleges of Woolwich, Sandhurst and West Point (U.S.A.); (2) narrative of the steps leading to the opening of the college; (3) description of the college buildings and works; (4) objects, ideals, and curriculum of the college. The appendices contain extracts from Lord Kitchener's Memorandum on the defence of Australia, names of cadets, time table, etc. The following notes on the college are abridged from Parts 2, 3, and 4 of the Report.

The establishment of a military college in Australia was first suggested by Colonel E. Hewitt, C.M.G., in the eighties, but the plan did not then take practical shape. When, however, compulsory service was introduced a military college became not only practicable but necessary, and it formed one of the cardinal points of Lord Kitchener's Memorandum on the Defence of Australia in 1910. Reckoning the average annual output required to maintain a staff corps of 300 officers at 18 cadets, the period of training a cadet as three years, and the margin of casualties at ten per cent., Lord Kitchener advised that the annual entry of cadets should be 33, making a total establishment of 100 for the college.[1] No time was lost in giving effect to Lord Kitchener's proposals. It was desired by the Australian Government that the site should, if possible, be near that of Canberra, the new Federal Capital; accordingly in October, 1910, the lease of Duntroon, a homestead in the Federal territory, with 370 acres of land, was obtained on behalf of the Government, and the construction of temporary barracks was commenced.

The homestead of Duntroon is some 37 miles by road from Yass on the Sydney-Melbourne railway, and seven miles from Queanbeyan on the Cooma line; it is within eight hours of Sydney and 15 of Melbourne. The land was originally granted in 1825 to a Mr. R. Campbell in compensation for his ship, which was lost in the service of the Government; the earliest record of any exploration in the neighbourhood is in May, 1823, just 89 years before the opening of the new establishment.

The college stands between 1,900 and 1,950 feet above sea level. Behind it rise the wooded slopes of Mount Pleasant (2,175 feet); in front lie wide open plains (see Frontispiece). The country is naturally well suited for instruction in drill and field work; the buildings are protected by Mount Pleasant from the cold S.-W. winds in winter, but are open to the cool summer breezes. The climate is bracing and perhaps more equable than that of any other similar institution.

It was decided that admission should be by competitive examination; but, as it was desired that lads who had had no other educational oppor-

[1] This has since been increased to 150, but the full establishment will not be reached until 1914.

tunities than those of the State schools should have a reasonable chance of admission, the standard of the examination was purposely kept low; in order, however, that the standard of graduation might equal that of other military colleges the course was provisionally fixed at four years.

As a result of a recommendation made by Lord Kitchener it had been agreed between New Zealand and Australia that ten cadets from the Dominion should be admitted to the Commonwealth Military College on condition that New Zealand was to pay £200 per annum for each cadet, and that the lads should, while at the college, be subject to the Commonwealth Defence Act.

The first entrance examination was conducted in Australia in February, 1911; in future it will be held in November of each year. The 33 Australian vacancies were allotted to States on the basis of population; roughly there were three candidates for each vacancy, except in Western Australia where there were 11 candidates for two vacancies. The mean age of candidates was 17½ years.

The staff, consisting of the Commandant,[1] director of military art,[1] director of drill,[1] instructor in military engineering,[1] instructor in mounted drill and riding, adjutant, quartermaster, medical officer, three civilian professors, chaplain and accountant, were assembled at Duntroon in April, 1911; the opening of the college had, however, to be postponed for some weeks; eventually the cadets joined on the 22nd June and were provided with uniforms by the 27th June on which date the college was officially opened by His Excellency the Governor-General (see Frontispiece).

The cadets are, at present, accommodated in huts built of fibrous cement. Each cadet has a room to himself; there are also a mess room, science laboratories, a lecture theatre, workshops, and stables for 50 horses; some of the above buildings are still unfinished. There is a parade ground 87 yards by 77 yards, and nine acres of ground are being prepared for cricket and football grounds.

The military status of a staff cadet is that of a private in the Permanent Forces; the corps is organized on the lines of an infantry battalion, the director of drill being the battalion commander, and the military instructors company officers. When the full establishment is reached there will be two companies, one of the 1st and 3rd and one of the 2nd and 4th classes; there will be 55 cadet N.C.O.'s, all of whom except 13 will belong to the 1st and 2nd classes.

Cadets receive £30 outfit allowance on joining and 5s. 6d. per diem, which it is estimated will defray the cost of books, messing, and upkeep of kit. They are required to make their own beds, clean their own boots, and keep their rifles, kit, and rooms clean and tidy.

The chapter dealing with the object and ideals of the college commences with a short comparison of the systems at Woolwich, Sandhurst, and West Point (U.S.A.) After recalling Lord Kitchener's recommendation that the new college should resemble West Point in its ideals, but that, in practice, regard must be had to difference of circumstances and national characteristics, the Report recapitulates the ideals of the West Point system as follows:—

"1st. The moulding of character and the establishment of military habits by means of strict, consistent, and continuous discipline.

"2nd. The right training of the mind, *i.e.*, the development of the power of acquiring knowledge and of using it when acquired.

---

[1] Regular officers of the British Army.

" 3. The inclusion of the essentials of all arms in the technical military education. Specialist instruction to be obtained in special schools after graduation."

It is in this sense, the Report adds, that Lord Kitchener's recommendation has been interpreted; a strict continuous discipline is to be enforced as a test of character.

The curriculum aims at providing sound teaching in principles, and a technical military education embracing the elements of the knowledge of all the arms.

Of the present four years' course, roughly, the first two are to be devoted to civil subjects, the second two years to military subjects, and during the whole four years two hours a day will be allotted to physical training, drills (both foot and mounted), musketry, signalling, and other military exercises. Infantry drill and musketry will be taught in the first year, riding in the second year, advanced infantry work in the third year, and advanced mounted drills and artillery driving in the last year.

From about Christmas till the end of February studies are suspended, and cadets at the end of their first and third years go into camp for additional practice in field work. In order that the full value of this work may be secured some instruction in military work has been included in the first year's course and will be repeated in the second.

The subjects are organized in military or civil departments, the time allotted to the former being at least as much as at Woolwich.

The cadets will eventually be organized in four classes corresponding to the four years of study; each class is divided into three sections of 15 or less; as a rule only one section is to be under instruction in one subject at the same time.

The teaching of civil and military history is co-ordinated, and lectures are given on current military events. For practical instruction in coast artillery cadets are to make visits to Sydney and to the Cordite and Small Arms factories. The time table is arranged so as to leave two hours free daily for games. It is expected that the standard of graduation will be at least as high as that of Woolwich.

***

It will be seen from the above outline that, in the concluding words of the Report, an institution has been founded of which Australia may in the future be as justly proud as America is of West Point.

Colonies and Protectorates.

COLONIAL GOVERNORS.—Sir W. Egerton, Governor of Southern Nigeria, has been appointed to succeed Sir F. Hodgson as Governor of British Guiana; Sir E. B. Sweet-Escott, Governor of the Leeward Islands, has been appointed Governor of Fiji and High Commissioner for the Western Pacific, in succession to Sir F. H. May; Sir F. H. May, Governor of Fiji, has succeeded Sir F. Lugard as Governor of Hong Kong; and Sir F. Lugard, Governor of Hong Kong, has been appointed Governor of both Northern and Southern Nigeria.

THE SUDAN.—On February 27th, Lord Kitchener formally opened the extension of the railway from Khartum to El Obeid, the capital of Kordofan.

INDIA.

THE ABOR EXPEDITION.—The Abor Expedition has encountered no further opposition. At the end of February exploring columns were still out up the Dihang and Yamne Rivers. Survey work was being impeded by mist and rain.

The work of the Mishmi Mission has been continued uneventfully. The position of Rima is said to have now been fixed 19 miles further north and seven miles further west than shown on existing maps.

W.T. STATIONS.—The wireless telegraph stations at Delhi (600 miles radius) and Jutogh (300 miles radius) have been completed, and are found to work satisfactorily.

TRANS-PERSIAN RAILWAY.—An experienced railway officer has proceeded to Pasni, with a survey staff, on special duty in connection with the Baluchistan section of the proposed trans-Persian Railway.

ADEN.—Major-General Sir J. A. Bell, K.C.V.O., Political Resident, Aden, left Aden for Sokotra on 8th February, with half a company, 1st battalion the Lincolnshire Regiment, and two maxim guns, to obtain from the Sultan of Sokotra an explanation of the looting of the S.S. " Kuala " in November last.

AUSTRIA-HUNGARY.

DEATH OF COUNT AERENTHAL.—The chief event of political importance has been the death of Count Aerenthal, the well-known Minister for Foreign Affairs. Count Aerenthal first rose to European celebrity through his skilful handling of the situation connected with annexation of Bosnia-Herzegovina, and has since been chiefly known as a firm upholder of the Triple Alliance, and a successful opponent of all attempts to deflect Austrian policy in a direction antagonistic to Italy.

The new Foreign Minister, Count Berchtold, has, in the more recent stages of his career, followed closely in the footsteps of Count Aerenthal, whom he succeeded as Ambassador at St. Petersburg. His appointment appears to have made a good impression both in Rome and St. Petersburg.

HONVED BUDGET.—The estimates for the Hungarian Honved Army for 1912 show an increase of some £150,000 over those of 1911. The increase is calculated to provide for: an increase in the number of N.C.O.'s; readjustment of territorial districts and recruiting areas; an increase of three battalions and Headquarter Staffs for four infantry regiments; increase by five men and five horses of the peace establishment of cavalry squadrons; the raising of two field artillery regiments of four batteries each; the appointment of 32 Landsturm Commandants.

MILITARY RANK.—It is reported in the Press that a new rank for officers, that of Vice-Major, is to be created, to which captains of more than nine years' service as such will be promoted. The badges of rank will consist of a white or gold button below the three stars which denote captain's rank, and of a major's stripe on the arm of the coat.

There are reports that all minor punishments for officers, such as arrest for a specified number of days, etc., are to be entirely abolished in the near future.

AUSTRIAN " ARMY REVIEW." —It has been decided by the War Office to publish an official monthly Review of current military literature and events of importance, both Austrian and foreign. The Review is named *Militärliterarische Rundschau.*

BELGIUM.

RESIGNATION OF MINISTER OF WAR.—General Hellebaut, Minister of War, has resigned. He was severely criticised during the recent debates

in the Belgian Parliament, and his resignation is claimed as a victory by those in favour of a more efficient army. Baron de Brogueville, the Prime Minister, will, as a temporary measure, act as Minister of War.

The authorities continue to improve the national defences, and guns and ammunition were sent to Namur during January.

MACHINE GUNS.—The military authorities have after prolonged trials decided to adopt the Maxim machine gun with a calibre of 7.65 mm.

BELGIAN CONGO.—A somewhat serious rising has taken place in the Welle district, and the rebels have massacred several hundreds of the Wahema tribe who were loyal to the Belgians.

It has been decided to raise a cyclist company, with a strength of 100 men, at Katanga, the garrison of which place is being concentrated in Elizabethville; the posts of Sampwe, Lukafu, and Kasenje are being suppressed.

BULGARIA.

POLITICAL.—The coming of age of the Crown Prince Boris was celebrated at Sofia on February 2nd. All the future rulers of the Christian States in the Balkan Peninsula attended a thanksgiving service, in accordance with the ritual of their common faith. Special significance is attached to the visit of the Crown Prince Constantine of Greece as marking a step forward in the " rapprochement " between the two countries. This "rapprochement" was inaugurated by the Macedonian peasants, and is also largely due to the tact and ability of the Greek representative, M. Panas. It is believed that a complete understanding has already been arrived at between Greece and Bulgaria, which may also include Servia in an " entente," designed to bring about a solution of the Balkan question. King Ferdinand left Sofia on February 14th for abroad; he may pay an official visit to Athens in March.

ARMY.—A decree of 17th Jan. has fixed the composition and duties of the higher Military Council.

The following are the essential points of this decree:—

President of the Council—The War Minister.

Members—(i) The Chief of the General Staff. (ii) Three Generals Commanding Inspectional Divisions. (iii) The Inspectors-General of Artillery, Cavalry, Engineers, and Infantry. (iv) Aide-de-Camp General to the King. Other officials may be added as members by the War Minister, such as Divisional Commanders, and the heads of departments. The Council assembles once a year, usually at the end of the summer manœuvres, but the War Minister can convene it at any time to discuss military matters, especially the table for the promotion of officers. Resolutions are carried by vote, the Minister having the casting vote; the War Minister has to pay special attention to any resolutions passed by the Council, which are registered and submitted for approval to the Sovereign.

FRANCE.

OFFICERS.—M. Millerand has abolished the system of demanding from the prefects reports on the political opinions of officers. In future, no prefect is to be asked for such a report except by the express permission of the Minister of War.

FRANCO-GERMAN TREATY.—The Senate has approved by 393 votes to 36 the Franco-German Treaty of last November. M. Clémenceau and

General Mercier voted against the treaty, while several prominent senators, including MM. Pichon, Pelletan, and Dubost abstained from voting.

Parliament has passed a law by which the Minister of War can either retire or place in the reserve any general officer who is no longer considered fit to perform the duties of his rank.

On the 12th February, General Langlois, the distinguished French General and author, died at the Val de Grace military Hospital, at the age of 72. General Langlois served as a captain in the war of 1870, and was subsequently a director of the War School, commander of the 20th Army Corps (1901) and Member of the Army Council (1902). He founded the *Revue Militaire Générale*, and was the author of a large number of military works, among which, perhaps, the best known is "L'Artillerie de campagne en liaison avec les autres armes." In 1911, he was admitted to the *Académie Française*.

ARTILLERY.—The law of July, 1909, divided the garrison artillery into 42 coast defence batteries and 47 land defence batteries. A decree of the 3rd February, 1912, has modified this law by fixing the number of coast batteries at 32, and of land batteries at 57.

During the Senate debate on the 1912 Army Estimates, M. Millerand stated that a new 75 mm. howitzer had been finished and was being tried; a 120 mm. howitzer will be ready for trials by the end of February, and a 105 mm. howitzer by the end of March.

French Colonies and Protectorates.

ALGERIA.—By a decree of 3rd February, 1912, compulsory service has been introduced for the natives in Algeria. The period of service is three years in the active army and seven years in the reserve. Every year the number of recruits to be found is fixed by the Minister of War, and the selection is by the ballot. Substitution is allowed.

TUNIS.—Parliament has approved of a loan of £3,620,000 for the construction of the following lines: Graiba—Gabes; Tozer—Metlaui; Tunis—Tebursuk, with a branch to Gubillat; Tunis—Hamman (electric).

FRENCH WEST AFRICA.—By a decree of 7th February, 1912, the native regiments of this Colony can be recruited by compulsory service if the number of voluntary engagements is not sufficient. The period of compulsory service is four years in the active army and 11 years in the reserve. Voluntary engagements are for five or six years, and re-engagements are allowed up to a total service of 15 years.

EQUATORIAL AFRICA.—The Sultan of Dar-Sila (Wadai) made his submission to the French in January.

Marocco.

A detachment of four officers and 35 men, with four Blériot aeroplanes, have arrived in Marocco for the purpose of founding aviation centres at Fez and Casablanca. Some of the tribes are again showing signs of unrest, and Colonel Simon's column which is guarding the Naba—Mekinez line, was attacked and lost four killed.

GERMANY.

POLITICAL AND GENERAL. NEW NATIONALITY LAW.—The Federal Council has adopted the draft of the new Nationality Law, which makes the loss of German nationality more difficult, and its resumption easier

than before. It is provided that a German residing abroad who has not performed his military service before the end of his 31st year shall lose his German nationality.

The total number of German emigrants in 1911 is stated to have been 23,500 as against 25,531 in 1910.

A New German National Defence League (*Deutscher Wehrverein*) was formally constituted on the 28th January. Its object was stated to be "the strengthening of the patriotic consciousness and the maintenance of a manful spirit in the people." The preliminary "programme" of the league is merely the supposed army programme of the Government slightly enlarged. The general opinion as to the significance of this league appears to be that it is intended to perform for the army services similar to those which the Navy League has so successfully rendered to the Navy. A membership of 4,000 was announced at the opening meeting.

The attachment of 26 Brazilian officers to various arms of the German Army has been approved. Among them are three German-Brazilians.

EQUIPMENT.—An Army Order has been issued authorizing lace boots and leggings to be worn by officers in lieu of top boots. No sealed pattern of legging has been laid down, and uniformity within units is not required.

It is reported that the issue of wire cutters to all arms of the service has been completed. They are to be carried partly by the troops and partly on wagons.

It is rumoured that a new pattern cloth glove is to be introduced to replace the knitted gloves and fingerless mitts worn hitherto. The new glove is of the mitt type, but has a special finger for the trigger finger.

TRANSPORT.—A winter exercise of the Motor Traction Section occupied the first half of February, and the following vehicles took part in it:—seven ordinary motor cars, six army mechanical transport trains, one motor lorry, and one motor omnibus.

Experiments in packing heavy projectiles for transport by rail are being carried out with a new *transporteur* for heavy projectiles. The employment of a frame which holds the shell absolutely firm reduces the chances of explosion to a minimum.

TRAINING.—It is reported that it is intended to call out the *Ersatz* reservists for a ten, six, or four weeks' training this winter for the first time.

A Field Engineering Manual for all arms has recently been issued and marks a new departure in German regulations. The issue is interesting as indicating the trend of German opinion as to the importance of field fortification.

BAVARIA.—The Bavarian War Minister v. Horn has resigned, and has been succeeded by General of Cavalry Freiherr Kress zu Kressenstein, the late Commander of the IIIrd Bavarian Army Corps.

It is reported in the Press that a 3rd Bavarian Foot Artillery Regiment is to be formed and to be stationed at Ingolstadt.

FORTIFICATIONS.—The (Swiss) *Gazette de Lausanne*, commenting on the construction of fortifications at Huningen (near Basle) by the German military authorities, says that this procedure is contrary to the provisions of the Treaty of Paris of 1815. The works are intended to protect the railway bridges in the neighbourhood of Huningen.

BORKUM AND EMDEN.—It is reported in the Press that the garrison of Borkum was increased on the 1st February by a battery of foot artillery. Several additional heavy guns are reported to have arrived recently at Borkum, apparently of 28 cm. calibre.

It is rumoured that it is under consideration to convert Emden into a naval port. The military garrison is to be considerably increased, and a regiment of foot artillery at Münster is stated to have received notice of its pending transference to Emden.

NEW ARMOURED FORTS AT METZ.—As announced in the last year's Army Orders, the group of forts at Orny bei Metz, is to be named "Fort Prinz Regent Luitpold," and the group at Mercy bei Metz "Fort Feld Marschall v. der Golz." The announcement draws attention to the systematic development of the fortress system of Metz, a development which has now been in progress for some years, and in which an important part is played by armour in the construction of the new works. A great part of the ancient enceinte has fallen in, or has been removed. It is not proposed to replace it as the old "Outer Forts" practically serve as an enceinte.

A new outer line of forts has now been constructed, at first only on the west bank of the Moselle; such were Fort Lothringen, to the north towards Thionville; Fort Kaiserin, further south, near Point du Jour (close to Gravelotte); Fort Kronprinz (at Gorgimont on the Moselle); Fort Graf Haesler, to the south of Metz, between the Moselle and the Seille on the little knoll of St. Blaise.

Recently, however, the scope of the original design has been extended and forts have been built on the eastern bank of the Moselle. Thus Fort Wagner has been constructed near Avigy; the next few years will witness the completion of other works due east of Metz which will finally link up the old Fort Manteuffel to the more modern Fort Lothringen, thus completing the girdle of new armoured works

These armoured forts are independent groups of works consisting (*a*) of single armoured batteries, armed with 10-cm. or 15-cm. guns and 15-cm. howitzers; and (*b*) of a large infantry work. The garrison (which is composed of one to two battalions of infantry, two to four companies of foot artillery, besides a proportion of the technical arms) is accommodated in bomb proofs situated partly under ground, communication to the fighting stations being afforded by subterranean passages. The whole group is surrounded by a barbed wire obstacle, which is commanded by small armoured infantry works with machine guns and quick-firing guns.

These new forts have greatly increased the strength of Metz as a fortress. as their attack would necessitate the use of the most powerful artillery. At the same time, however, the new advanced line has added considerably to the perimeter of the fortress, thus involving an increase in the personnel and materiel required for its defence. Metz and Thionville (which is now being strengthened with armoured works in the same way), form, together, a fortified line (on the model of Brialmont's "groups") which will be all the stronger if, as may be assumed, the line of the Moselle. between the two fortresses is strengthened with heavy guns.

The importance of such a position lies in its compelling an enemy, advancing on a broad front, to divide his forces.

—*Précis from Ueberall.*

German Colonies.

GENERAL.—A new Press law dealing with the Press in the Colonies is to come into force on the 1st April, 1912. The law conforms in the main to that for the home country. An interesting paragraph is to the effect that in time of war, unrest, or insurrection, the Governor of a Colony can forbid the publication of news regarding warlike measures, movements of troops, etc.

GERMAN SOUTH-WEST AFRICA.—The wireless telegraph station in Swakopmund is sufficiently advanced for communication to be obtained with passing vessels. The tower is 278 feet high. The construction of the landing stage at Swakopmund is making good progress.

TOGOLAND.—The importation of firearms is extraordinarily high. In 1910 no less than 17,102 were imported (as against 5,110 in the rest of the German Colonies put together), together with 154 tons of powder and caps.

A temporary landing stage is to begun at once to replace the one partially destroyed in Togo in May, 1911; this is to be ready by the 1st July, 1912. In the meantime a permanent landing stage is to be begun.

CAMEROONS.—Considerable delay has been caused in the construction of the Central Railway by the difficulties experienced in bridging the numerous rivers. These bridges are all completed now in the section Duala—Edea with the exception of that across the northern arm of the Sanaga.

HOLLAND.

ARMY.—It is stated in the Press that the Dutch Officers' Association, which now numbers 663 members, has been officially recognized by the Minister of War.

It is reported that a combined shell is to be introduced in the Dutch artillery. No details have, as yet, been given.

The Militia Law was passed by the First Chamber on February 1st.

RAILWAYS.—A project has been placed before Parliament for sanction for a railway from Roermond near the Belgian frontier towards Kessinich. The Government has been asked to find £19,375, being 5/11 of the estimated cost.

DUTCH COLONIES.—It is stated that the War Office and General Staff of the Army of the Netherlands East Indies are to be moved to Bandoeng by the 1st January, 1915.

The Staatscourant of 14th January contained a decree providing a supplementary sum of £83,300 for the construction of railways in S. Sumatra.

The Press reports that the Marconi station in Curaçao (Dutch West Indies) has been in communication with ships 2,500 kilometres distant, and that New York has also been communicated with several times.

JAPAN.

NEW CAVALRY TRAINING MANUAL.—The new Cavalry Training Manual has, after several delays, been completed, and will shortly be published. (The Manuals of the other arms, revised in accordance with the experience of the late war, have already appeared). It is stated in the Japanese Press that the Cavalry Training Manual is divided into two parts, viz.: Part 1, Elementary Training, Mounted and Dismounted; Part 2, Mounted and Dismounted Actions; Action of Horse Artillery and Machine Guns; and Pursuit and Retreat. It directs that the 32nd year (1899) cavalry sword is to be attached to the saddle, that the 30th year (1897) bayonet is to be carried on the person, and that the bayonet with the 38th year (1905) carbine is to be used for fighting dismounted at close quarters.

TRAINING IN 1912.—Notice of the following exercises has appeared in the native Press:—

(a) Transport Corps Manœuvres, by the 4th, 10th, and 16th battalions from the 19th February under the Inspector-General of Transport.

(b) Forced marches, 330 and 125 miles in length, by the 3rd and 4th regiments of Field Artillery respectively. The former is to be carried out in 8 and the latter in 4 days.

ANTUNG-MUKDEN RAILWAY.—The Antung-Mukden Railway and the Yalu bridge were officially opened on November 1st, 1911. This route will, however, supplement rather than compete with other lines connecting Europe and Japan, as the distance from Tokio to Harbin *via* Vladivostok is 600 miles shorter than by this route.

LUXEMBURG.

DEATH OF THE GRAND DUKE.—The Grand Duke of Luxemburg died on the 25th February. He is succeeded by his daughter, Princess Marie, who becomes Grand Duchess under the Act of 1907. Her mother will retain the Regency, which she has held since 1908, until the Grand Duchess attains her 18th year next June.

MONTENEGRO.

King Nicholas of Montenegro has been paying an official visit to the Czar of Russia, at Tsarkoye Selo. His reception appears to have been most cordial, and a round of official festivities was closed by his appointment to the rank of Field Marshal in the Russian Army.

Dissatisfaction still continues with regard to the attitude of Turkey in respect to the delimitation of the Turco-Montenegrin boundary.

NORWAY.

MILITARY BUDGET.—The Norwegian Army Estimates for 1912-1913 amount to £854,000, an increase of £18,000 over the previous estimates. The increase is due mainly to the higher cost of supplies, and to the development of the scheme for the training establishments of the Army. The Extraordinary Expenditure amounts to £33,000, of which £5,500 is allotted to provide training grounds for the 6th Field Brigade in the Tromso district.

MOUNTAIN ARTILLERY.—A sum of £11,000 is provided under Extraordinary Expenditure for the purchase of mountain guns and ammunition. One four-gun battery has already been supplied by the Rheinische Metalwaarenfabrik, and eight more guns will now be puchased. A single type of projectile (shrapnel) has been adopted. It is expected that the rearmament of the mountain artillery will cost altogether £97,000.

RIFLE CLUBS.—The vote for the Rifle Associations amounts to £13,200, an increase of £400.

OTTOMAN EMPIRE.

CONSTANTINOPLE.—It is proposed at last to abolish the state of siege which has held good in Constantinople now since the spring of 1909.

YEMEN.—The report that the Farsan Islands have been occupied by the Italians in conjunction with Seyyid Idrisse is denied (see page 416), but the latter is said to have received from the Italians, rifles and machine and field guns, with ammunition.

Though the agreement with the Imam Yahia has now been ratified by Imperial Iradé, the settlement is apparantly not concurred in throughout the Yemen, since it is reported that the Imam El Dohiami is now in arms with a considerable following.

MACEDONIA.—Further outrages are announced from Macedonia, but a commission appointed by the Government has now arrived in the province, and it is hoped that the better elements among the population may co-operate towards a return to the more peaceful conditions which have recently prevailed.

ALBANIA.—There has been some considerable discontent among the troops quartered in Albania, resulting, it is said, in more than one case in open mutiny. As regards the locality generally, the Government appears to be adopting a milder and more sympathetic policy with the tribes, but the difficulties in the way of a complete adjustment of differences are very great.

MESOPOTAMIA.—It is expected that the Baghdad railway will be open to Mosul in two years, and to Baghdad in four years. The latter period may, however, be shortened if some arrangement is arrived at for a combination of interests in regard to the Tigris river traffic, as between the railway company and the two existing steamship lines.

CRETE.—The Cretan "Revolutionary" Government, undeterred by the stoppage of the deputies who were proceeding to Greece to present themselves before the Greek National Assembly, have announced that they are determined to elect fresh deputies, who shall endeavour by every means in their power to proceed to Greece next month. The Protecting Powers have addressed a sharply-worded warning to the Cretan Government, but it is possible that this may not have the effect desired, in which case it may become necessary to re-occupy the island by international troops.

ARMY ORGANIZATION.—The creation is announced of a VI Redif Inspection to comprise those units of the I and II Redif Inspections in S.W. Anatolia. The new Inspection will be affiliated to Army Inspection No. I, and will cause the II Redif Inspection now to be confined wholly to Europe.

MACHINE-GUNS.—The number of machine-gun companies (four-gun units) now formed in Turkey amounts probably to 93, with some further guns under order.

RAILWAYS.—The arrangements for the further construction of the branch line from Ada Bazar (Anatolian Railway) have been completed. The short stretch already made to Ada Bazar branches off from the main line at Anfie (near Ismid), and the present continuation will be made to Boli, 130 kiloms. Guarantees for the kilometric payments for this line have been assigned from Customs duties, an important step on the part of the Government.

PERSIA.

An Anglo-Russian note, embodying the new programme of joint policy, was presented to the Persian Government on 18th February. The two Powers are willing to advance jointly to the Persian Government the sum of £200,000 under certain safeguards, to meet immediate requirements only. It is hoped that a larger loan will be arranged shortly through the ordinary financial channels.

Some Russian troops appear to have been transferred from Kazvin to Resht. A reinforcement has been sent to the Mazandaran Province and to Astrabad. It is reported in the Press that some of the troops now at Tabriz are to return to Russia shortly.

Negotiations have been opened between the Persian Government and the ex-Shah through the Russian Consul at Astrabad. The Persian Government has offered the ex-Shah a full amnesty and a pension provided he leaves Persia. Offers of a similar nature are also to be made to Shua-es-Sultaneh and Salar-ed-Dowleh. Meanwhile there is little doubt that intrigues on behalf of the ex-Shah are still being continued in Northern Persia.

It is reported that Government troops defeated the forces of the ex-Shah near Astrabad on February 12th. A Government force has arrived at Kermanshah, whence Salar-ed-Dowleh has fled.

THE ROAD FROM BUSHIRE TO SHIRAZ.—The following notes on the road from Bushire to Shiraz are contributed by an officer who performed the journey during the winter of 1910-11.

"Bushire, though shown on the map as an island, is situated at the point of a peninsula, jutting out some five or six miles from the mainland, with which it is connected by a narrow, low-lying strip of land, which is at high tide practically a swamp. There are a few fine buildings in the town, notably the British Consulate, the offices of the Imperial Bank of Persia, and the residence of the "Daria Begie," the Persian Governor. The European residents, about thirty in all, live some distance outside the town. The majority of them are British, Bushire being the headquarters of the British Consul-General and Resident in the Gulf; but there are besides Russian, German, French, and Turkish Consuls, a Belgian Director of Customs, and a French doctor.

From November to March the weather is cold enough to make one thoroughly appreciate a fire in the evening.

The Persian mule drivers are, as a class, well built, cheery, and very hard working; in fact, they appear to be the only class of Persian who ever do a stroke of work. The first stage of our march was to Ahmadi (23 miles). About 5 miles from Bushire the track enters the "Mashela," or swamp, which in dry weather is hard "pat," but after heavy rain becomes soft liquid mud, very heavy going even for the mules. . . .

On the following day we reached Borasjun, a small Persian town, with an Indo-European telegraph office. . . . The next day took us to Daliki, a very pretty little village, right under the slope of the steep mountains which run along parallel to the coast. So far we had been travelling for about 45 miles straight across a flat plain which runs along between the mountains and the sea. At every stage on the road we found either a rest room or a room set aside in the caravanserai, kept whitewashed and clean by the Indo-European telegraph department for the use of their officials travelling on the road.

At Daliki we entered the hills, and did not leave them, except to cross valleys between one range and the next, until we reached Shiraz. The road was an extremely rough mule track at first, up and down hills, and then following the bed of a small stream down to the Daliki river, the latter was crossed by a six-arched stone bridge, approached by a causeway of rough cobble stones. After crossing the bridge the road follows the bank of the river a short way, and then, turning off, comes suddenly to the "Cursed Kotal," the first of the four *kotals* between Bushire and Shiraz. This *kotal* is larger, though not so steep as the others, but there is little to choose between them as regards the track, which is as bad for animals as it could possibly be. Up the steepest part of this *kotal* for about a mile there is a made road, paved with the usual rough cobble stones, which is of some assistance to mules making the ascent, but too

steep for them to keep their footing when coming down. On this day the Persian road guards were seen for the first time, and from here on to Shiraz they were encountered every five or six miles. As each caravan passes, they count the mules, and take a toll at the rate usually of five shahis (about an anna) per mule. These men are supposed to be there for the protection of caravans from brigands; they receive no pay, and this toll is quite a recognized institution. . . . .

The total amount of these tolls for the whole journey from Bushire to Shiraz comes to about one toman (three rupees) per mule, though it varies according to the state of order or disorder on the road, and has been known to be as high as five tomans per mule.

At the top of the *kotal*, the track crosses a plain about five miles broad, with the village and rest house of Konar Takhteh in the middle, and then enters the hills again, and winds about for some miles till it reaches the second or Kumarij Kotal, called after the village at its head. This is much shorter, though steeper than the former one, and the road is equally bad, but from the top of it one obtains a very fine view of the flat plain of Kumarij just below, about five miles square, and almost all under cultivation.

Emerging from a narrow rocky " tangi " on the further side of this plain, you come into the Kazarun plain, across which can be seen in the distance the ruins of Shahpur under the hills. The six tablets there, cut out of the face of the rock are well worth seeing, the largest one, representing the defeat of a Roman general by the Persian King Shahpur, being about 20 ft. by 15 ft., and the figures standing out about a foot from the face of the rock.

Kazarun is quite a fair-sized Persian town, surrounded with gardens, and the biggest place between Bushire and Shiraz. About three miles from the town the ground is very swampy, and the whole plain was black with thousands of duck; there were also large numbers of snipe.

From Kazarun the road continues up the valley for about nine miles, then, turning to the left, it winds up the Kotal i Dukhtar (or Daughter's Pass). From near the top of this *kotal*, which is the shortest and steepest of the four, a very fine view of the Kazarun Valley is obtained. On the top of this *kotal* the road enters a forest of oak trees, from which it emerges at the foot of the last *kotal*, the Pir i Zan (or Old Woman's Pass). This pass is a climb of over five miles, and though the road is very bad, it is nowhere nearly as steep as the other *kotals*. At the foot of the pass about four inches of snow was lying, but this had increased to about a foot at the Caravanserai of Mian Kotal, situated on a small flat plateau about two miles up the pass. In this day's march we had risen over 2,000 ft., and passed from spring to the depths of winter.

After leaving Mian Kotal the snow became so deep that it was impossible to proceed, and owing to lack of supplies, we were forced to return to Kazarun. . . . .

Leaving Mian Kotal, the snow got deeper at every step, and the mules sank up to their girths, and had to be unloaded, pulled out, and reloaded again every twenty or thirty yards.

By the time that the road was again reported passable, the pass had been closed altogether for about three weeks, and there were over two thousand mules held up at Kazarun. Loading up at 12 midnight, we left Mian Kotal by 1.15 a.m.; we reached Dasht i Arjin (11 miles) by about 9.30 a.m., just in time, as the sun was already beginning to soften the frozen crust of snow; the top of the pass is 7,400 feet above the sea level.

From Dasht i Arjin to Kan i Zinian, and thence to Shiraz, the road presented no further difficulties; snow was lying to within two miles of Shiraz, but it was no longer of any great depth.

At about eight miles from Shiraz the track emerges from the hills on to the Shiraz Plain, towards the further side of which is the town itself, looking like a large Indian bazaar, and surrounded on all sides by the gardens for which it is famous. At the time of our visit there were 6,000 Persian troops stationed in Shiraz, but as they had received no pay for many months, and had already sold most of their uniforms, they were now engaged in cutting down the trees by the roadside to sell in the bazaar in order to live."

PORTUGAL.

ARMY.—A comprehensive scheme of army reform has been introduced in Portugal which, if carried out, will transform the existing army into a national militia.

COLONIES.—Large reinforcements reached Macao from Lourenço Marques in January, consisting partly of a European contingent of 25 artillery officers, 1 officer and 100 Civic Guards, and three officers, and of a native contingent from Mozambique of six European officers, seven European sergeants, seven corporals, and 190 privates.

RUMANIA.

ARMY.—A decree has been promulgated applying the law for the reorganization of the Army, which was passed in March, 1908, and modified in 1911. This decree, which defines the position of the various recruit contingents, is retrospective, and applies from 1st November, 1910.

RUSSIA.

POLITICAL.—King Nicholas I. of Montenegro arrived in St. Petersburg on the 10th February on a visit to the Emperor. He left Russia again on the 17th February.

With a few insignificant exceptions, the Russian Press was unanimous in its hearty welcome to the British visitors. They were presented to the Emperor and Empress at Tsarskoe Selo on the day after their arrival and were entertained at banquets by the municipality of St. Petersburg, the Council of the Empire and the Duma conjointly, and the Anglo-Russian Chamber of Commerce. The Deputation, after leaving St. Petersburg, paid a visit to Moscow, and left for England on the 4th February.

The Mayor and Councillors of St. Petersburg entertained their colleagues from Paris on the 15th February. It is said that, in the opinion of many Russians, this visit has a semi-political character. The visitors were warmly received both in Moscow and St. Petersburg.

The visit of the Grand Duke Andrew Vladimirovitch of Russia to the Emperor Francis Joseph at Vienna is regarded in some quarters as a sign of the commencement of better relations between the two empires than have existed since the annexation of Bosnia-Herzegovina in 1908.

THE CENTENARY OF THE 1812 CAMPAIGN.—The following general arrangements for the approaching celebrations in connection with the centenary of the War of 1812 have been approved by the Emperor.

The 8th September (26th August O.S.) being the date of the battle of Borodino, has been fixed upon for the celebration, which will take place on the battlefield, and will be attended by special units and detach-

ments of troops. The festivities on the succeeding days, which will be held in Moscow, will have a civil as well as a military character. On the 8th September, religious services, followed by military parades, will be held in all garrisons and camps, and independent celebrations will be organized in St. Petersburg and other important centres in the Empire. Medals will be issued in commemoration of the Centenary.

DEATH OF GENERAL COUNT MILYUTIN.—General Count Milyutin died on the 7th February at the age of 96. As War Minister he was responsible for the reorganization of the Russian Army, which commenced about 1862. The principal reforms then introduced were the reduction of the term of service in the Army, which up to that time had been for life, and the introduction of universal military service.

RAILWAYS.—The credits for 1912 allotted to the Ministry of Communications, allow for the purchase of 51 locomotives, 2,007 passenger coaches, and 88 goods trucks, at a cost of £1,887,148. A sum of £836,500 is allotted for relaying rails.

A movement having been instituted in Poland with the object of keeping the current year as a year of national mourning on account of the enforced purchase by the Russian Government of the Warsaw—Vienna railway system, and the transfer of the Kholm district from Poland to the Volinya Government, the Governor General of Poland has issued a notification that all persons who assist in any such movement will be liable to punishment.

SERVIA.

The Crown Prince has resigned his appointment of Inspector-General of the Army, as a protest against the feeble manner in which the Government coped with the growth of the Black Hand organization.

SWITZERLAND.

COMMUNICATIONS.—The scheme for connecting Lake Geneva with the Mediterranean by a road through the Alps has been resumed. In order to ensure direct communication between Nice and Thonon or Evian (both on the southern shores of Lake Geneva), it will be necessary to complete already existing national roads. The Paris—Lyons—Mediterranean Company started a motor car service on this road last year.

The electrification of the St. Gothard railway will be commenced this year.

ARMY.—The new Army Organization Scheme involves the raising of six m.g. groups for the Infantry of the State, and of six m.g. companies for the *Landwehr* Infantry. In accordance with Article 5 and Tables E. 6., and E. 7., of the Decree, each company will have its equipment raised from four to six and finally to eight guns. The *Landwehr* companies need not be considered at present as they cannot be formed until sufficient men have passed into the *Landwehr*. To begin with the *Elite* companies will be allotted only four guns.

UNITED STATES.

POLITICAL.—It is announced in the Press that Mr. Knox is to pay a round of visits to the American Republics in the Caribbean Sea. The objects of the tour are stated to be acquisition of information calculated to facilitate the settlement of questions outstanding in the Latin American Republics, and the manifestation of the friendly interest of the United States in the Republics.

SUSPENSION OF THE ADJUTANT-GENERAL.—A considerable sensation has been caused by the announcement that General Ainsworth, Adjutant-General of the United States Army, had been suspended from duty. It is stated that the immediate cause of the Secretary of War's action was General Ainsworth's answer to a memorandum directing him to report upon certain proposed innovations. The answer, which is said to have been couched in violent language, questioned the competency of the Chief of the Staff and the Secretary of War.

OTHER AMERICAN STATES.

MEXICO.—It is reported in a telegram from Mexico City that a general belief prevails that President Madero is face to face with a crisis, and that he and the Cabinet admit that the Zapata rebellion has grown to such proportions as to constitute a formidable menace to the new Government. This information appears also to be confirmed from Washington, where the United States Government are taking precautions against the possibility of a recrudescence of fighting in the vicinity of Juarez.

CHILE.—It is announced in the Press that the Chilean Senate passed a law which fixed the establishment of the land and sea forces for 1912 at 27,015 men, distributed as follows:—Army: Permanent Staff, 8,000; Conscripts, 9,860. Navy: Permanent Staff, 5,209; Conscripts, 709; Coast artillery, 1,500. Gendarmerie, 1,737; Grand total, 27,015 men.

In comparison with the Budget of 1911 there is an increase of 2,300 of all ranks.

ECUADOR.—It is stated in the Press that articles of peace have been signed, and that the revolution is now at an end.

The mob, however, are reported to have broken into the penitentiary at Quito and to have seized and lynched several prominent revolutionists. No further disturbances have taken place.

PARAGUAY.—The revolution in Paraguay continues. What fighting takes place is of a desultory character between small detachments scattered throughout a part of the interior and along the main rivers. The majority of the combatants are untrained peasants who have been forcibly recruited by one or other side.

The Argentine naval force in Paraguayan waters consists of seven ships of a total tonnage of 6,311 tons.

AERONAUTICAL NOTES.

BRITISH EMPIRE.

NEW FLYING CORPS.—On the 4th March the Under Secretary of State for War announced in Parliament the creation of a new flying corps, which was to consist of officers of both services and to be available for operations by land or sea. The scheme proposed involves the formation of a flying school for the corps at Netheravon, where some 180 officers will be trained each year after first obtaining flying certificates from the Royal Aero Club; 133 army officers and 30 or 40 naval officers will be required at once for the new corps and 131 aeroplanes will be purchased from British and foreign firms. Further particulars of this scheme will be given in a subsequent number of the JOURNAL.

BRITISH RECORD.—A record passenger carrying flight was achieved on February 14th by Lieut. Barrington-Kennett, Grenadier Guards (Army Air Battalion), who flew 249 miles 840 yards with a passenger, in the Army Section of the Mortimer Singer competition.

AUSTRALIAN COMMONWEALTH.—In December, 1911, the Australian Commonwealth invited applications from expert mechanists and aviators desirous of being appointed to the Defence Department. The salary offered is £400 per annum, inclusive of all allowances, except travelling; the Commonwealth Government accepts no liability for accidents; successful candidates are to be appointed for 12 months on probation, on conclusion of which their appointments may be confirmed.

FRANCE.

A special aeronautical "bureau" has been formed in the Engineer Directorate at the War Office.

According to M. Millerand the number of aeroplanes in the possession of the French army is 208. In the course of his speech the Minister of War stated that he was about to ask Parliament to sanction this year an expenditure of £960,000 for aviation and £320,000 for aerostation. The number of dirigibles will be fixed at 20. The aviation units will be the "escadrille" of eight machines divided into three active and one reserve sections. Each section will have two motor-trailers and one lorry and each "escadrille" will have in addition one motor workshop and one motor car. The personnel of an "escadrille" will be seven officer pilots, one administrative officer, six non-commissioned officers and 58 other ranks.

GERMANY.

AVIATION.—The training of officers in aviation is proceeding rapidly. On the 1st February, 1912, 32 officers began a course at Johannisthal. 12 officers were being trained at the Albatros aeroplane works and 15 more are to be trained at the same works in May. Another two months' course for officers is to begin on the 1st March at Johannisthal; it is stated that the applications for this course were so numerous that in all probability a supplementary class will be formed. It is further stated that nine officers are to commence a course of instruction at the new aviation school at Gotha on the 1st April.

Several noteworthy cross-country flights have been made during the month by officers from the military experimental establishment at Döberitz;

among these may be mentioned the flight of Lieutenant Bahrends, with a passenger, from Döberitz to Hamburg, a distance of 245 kilometres in two hours, ten minutes, without an intermediate landing (a German record).

A branch of the Döberitz School is to be established on the new manœuvre ground in Zehrensdorf near Zossen. The construction of sheds to hold 12 to 15 aeroplanes has already begun.

It is rumoured that aeroplane detachments are to be stationed in several of the eastern and western frontier fortresses, six to 12 machines being allotted to a detachment. It is anticipated that Metz will be furnished with six to eight machines.

AEROPLANES.—The number of aeroplanes owned by the military authorities is being increased. Quite recently orders were given for 15 Albatros, 15 Rumpler, two Harlan, three Euler, one Dorner, and 11 machines from the Aviatik Company of Mulhausen—a total of 47.

WIRELESS TELEGRAPHY AND AEROPLANES.—The chief engineer of the Albatros works, Herr Ekelmann, is stated to have completed an invention by which wireless telegraphic communication with aeroplanes has become practicable. The power is supplied by the aeroplane's motor; the whole apparatus weighs 77 lbs., and has a range of 150 kilometres.

The Emperor has offered a prize of £2,500 for the best German aeroplane motor, to be awarded on his next birthday. The military authorities have granted an additional £1,000 for prizes in connection with this competition.

AVIATION IN THE NAVY.—Several new machines have been purchased for naval use; these are chiefly of the Albatros type. One is to be sent to Kiel for the instruction of officers and another to Wilhelmshaven for a similar purpose. Some 20 naval officers have so far undergone a course in aviation, and many others are now preparing to qualify as pilots. Hydroplanes are reported to have been allotted to the two chief naval ports. It is also reported that six hangars have been erected at Danzig, near the dockyard, and others are to be built at Kiel and Wilhelmshaven. There is an unconfirmed rumour that Heligoland is to become an important naval aviation station. From all indications it appears that the aeroplane as a scouting auxiliary is to be thoroughly exploited in the German navy.

DIRIGIBLES.—The dirigible "P.L. VI." has been chartered by the Aero Association in Lucerne for daily passenger flights in that neighbourhood during July, August and September.

The "P.L. XI" has completed her trials to the satisfaction of the military authorities. She will in future be known as the P. 3 (? 4), and is to be permanently stationed in Königsberg. The trials included an endurance trial of 16 hours, a height test of 5,000 feet, and a speed test of 20 metre-seconds. The vessel's dimensions, etc., are as follows:—capacity 5,600 cubic metres; length 78 metres; diameter 11 metres; two motors 150 H.P. each; 2 semi-rigid propellers.

The "Z. II." is to be fitted with a long range wireless telegraphic installation. The "Schütte-Lanz" is to undergo her second series of trials in the first half of March. The "Viktoria-Luise" ("L.Z. XI") the latest of the Zeppelins, has undergone satisfactory trials and attained a speed of 20.2 metre-seconds. The Siemens-Schuckert airship has been undergoing her trials during the month and these are stated to have been satisfactory in spite of the unfavourable weather. Instead of water glycerine was used as ballast on account of the extreme cold. A speed of 19.82 metre-seconds was attained.

GENERAL.—A vote of £2,500 annually is proposed in the Prussian Chamber for assisting aeronautics. It is stated that the first step to be taken is the establishment of a Meteorological service for aviators.

AERIAL MANŒUVRES IN 1912.—It is intended to hold aerial manœuvres in Cologne in March and April, and in Metz in April and May, of sufficiently long duration to give a thorough training to the new air battalions.

UNITED STATES.

A prize of $15,000 has been offered by Mr. E. Gould for the most perfect and practicable heavier than air flying machine, designed and demonstrated in America and equipped with two or more engines, so connected that either engine may be operated independently or that they may be used together.

GENERAL.

AEROPLANES IN NAVAL WARFARE: A CONSIDERATION OF POSSIBILITIES.

The following interesting article by a German naval officer is reproduced from the *Scientific American.*

(A)—DEVELOPMENT.

THE development of the aeroplane is more recent than that of the dirigible, and it has been more rapid. The following is a brief review of its progress:—

The first successful flights with motor-driven aeroplanes (aside from the later abandoned tests of the Frenchman Oder, during the nineties of the last century) were made in Europe in the fall of 1906 by the Dane Ellehammer and by Santos Dumont, although the Wright brothers in America had achieved remarkable success even before this. As the American inventors did not, however, make their attempts public, but did so only when they saw the danger of being outstripped by French aviators, we may take as the beginning of the present period of development the fall of 1906. It took an entire year before H. Farman (January 3rd, 1908) made a successful round trip of 1,500 metres at a height of a few metres, winning the Deutsch prize of 40,000 francs. At the end of that year, the greatest distance covered was 124.7 kilometres; at the end of 1909, this was 234 kilometres, and in the end of 1910 it was 583 kilometres. The longest continuous flight was made a short time ago by H. Farman, remaining 8 hours, 12 minutes, 54 seconds in the air without a descent. The greatest altitude reached in the end of 1910 was 3,474 metres, the greatest speed 140 kilometres an hour, and the greatest number of passengers taken up by an aeroplane was six. We must admit that these are remarkable strides within the last three years.

Dangers in Flights.

In spite of all this we are still far away from the conquest of the air with aeroplanes, for their safety in flight and operation is far behind that of dirigible balloons. The efficiency and safety of the aeroplanes is dependent on the perfect working of the motor, even more than is the case with the dirigible balloon. If the motor fails, an unintentional limit is set to flight, and, more than that, have in many cases resulted in dangerous situations for the aviator, who must descend in a gliding downward

flight. He has very little influence on the choice of a landing place, and, under circumstances, cannot avoid a catastrophe, especially if the motor stops at a low height. Causes of accidents due to breaking and failing of constructive parts of the aeroplane, can be avoided more and more in the future, for we have gradually learned to judge the needed resistance of all parts properly. The carrying capacity of the aeroplanes is also great enough to allow excessive economy in weight to seem unjustifiable. In the past, of course, frequent accidents have happened due to the constructive material failing; most of these accidents being started by snapping of stiffening rods and wires. Monoplanes have suffered especially by breaking of the wings; but breaking of screws, breaking of chains and mishaps on the steering gear have also occurred.

Aside from the defects in the aeroplanes themselves, whose gradual elimination is to be expected, there are two further important causes of danger. The one is the element which we would like to rule, the other is in the aviator.

The dangers of the air are gusts of wind, whirlwinds, and, above all, vertical movements of the air. These phenomena lead to danger, not only on, or near the surface of the ground, but they destroy the stability also in flight at greater altitudes and may be causes of falls. The art of the aviator can meet these dangers to a great extent; this art can only be attained through long practice and intimate knowledge of the element just as the sailor learns his art thoroughly only through continuous battle with his element.

The dangers, finally, which rest with the aviator, are, that he makes blunders, that he dares too much, or underestimates the dangers of the weather conditions. These dangers also can be met by proper education and teaching.

The burning questions are, therefore, perfection of motors and education of a good corps of aviators. It is just as certain that even after reaching this goal, we will have accidents, as it is a fact that we cannot avoid them in other callings. They must be accepted, just as we have to accept the accidents on sea and in mines.

State of Development.

When we turn to the present state of aeronautics, we find that the efficiency is shown by the records mentioned above. The records have a special significance in the realm of aeronautics, because in the sharp competition of systems and types of constructors and aviators, as also of nations, every record reached is soon broken. In this way a wonderful result becomes soon a common one and the average efficiency increases. We must thank the sharp competition in all lines for the rapid development of aeroplanes.

France at the present date holds all records, except that of height, which has been contested within the last few months by America, and the former has about 87, or 70 per cent. of the total number of highest performances. America follows with 37 records; about 30 per cent. The American successes are, however, of a slightly more distant date, so that the superiority of France within the last year is even more remarkable than is evident from the figures.

Use of Mono and Biplanes.

Another question is also answered by the records, taken as indicators of efficiency; namely, how to value the two systems, the monoplane and biplanes, which are at present competing against each other.

While up to the middle of 1909 the biplane was the head in all lines (distance, endurance, height, speed and passenger flights) it has since that time shown itself inferior to the monoplane. As regards speed and distance, the monoplane is absolutely superior. On the other hand the biplane has an important line, in which it has remained victorious, namely that of passenger flights. Against the six persons that the biplane can carry, the monoplane has, up to now, only carried three persons.* Since probably in the future there will be no change in the relation between the two types, we have in these characteristics the right of existence of both types of aeroplanes; the biplane as load bearing, the monoplane as speedy aeroplane. Both will be used according to demand.

Aside from these main differences, we attribute greater stability in flight to the biplane, and prefer it because descent and landing are less dangerous than in the monoplane, due to the lower speed. Finally aviator and passengers are easier to accommodate and have a better outlook, both front and below, mostly unimpeded by the air current of the propeller, which is often very disagreeable in monoplanes. These factors speak favourably for its use in reconnoitring.

It must be said in favour of the monoplane that it uses less space and can be assembled quickly for use and again quickly dismantled for transportation. This point is important for its use on shipboard.

Although, besides these kites a large number of other aeroplanes have been constructed and tested, no great results have been achieved with such aeroplanes, so that it does not pay, at the present, to draw them into our discussion.

The Motor.

I would like to enter briefly on the motor question. How to cool the motor for aeroplanes is a very important question.

The first French aeroplanes were mostly equipped with air-cooled motors. This cooling permits the construction of a very light motor, as cylinder jacket, radiator, water pump, and pipe lines are eliminated; it has, however, proved insufficient in its elementary execution, so that the motors, due to extensive heating of cylinders during flight, lose in efficiency and are not fit for endurance tests.

The Wrights, and many German firms, on the other hand, use water-cooled motors, which are of course heavier, as already stated, but give more uniform results. Lately, however, the problem seems to have been solved in favour of the lighter air-cooling system, by the introduction of rotating motors. In these the cylinder casing rotates at about 1,200 revolutions per minute around the stationary shaft, whereby the external cylinder parts, that are to be cooled, move with great speed (about 50 metres) and consequently experience efficient cooling by the air through which they speed.

At the same time the rotating mass serves as an effective flywheel whereby a very uniform operation is caused.

The most numerous records have been obtained within the last year by the French Gnome motor, the first and most successful of this type. Germany began recently to build these rotating motors, but they still have to prove their efficiency in the competitive battle.

---

* These records are now obsolete. The Blériot "aerobus" has carried as many as twelve passengers and the pilot; the Bréguet biplane has carried 11 passengers and the pilot.—Ed. Sci. Am. Sup.

The weight of rotating motors with safe operating conditions is given as 1.0 to 1.5 kilogram per horse-power, whereas water-cooled motors weigh hardly less than 2.5 to 3 kilograms per horse-power.

(B)—USE IN NAVAL WARFARE.

Reconnoitring—Use in Coastwise Signalling.

It is evident that reconnoitring will be the main sphere of action for aeroplanes. Just like the dirigible it will be possible in certain cases for the aeroplane to supplement the signal and information service on land with more or less reliability.

If we take as efficiency a time of flight of four hours and a speed of 80 km. per hr., it is possible for an aviator sent out from the coast observation station to reconnoitre large regions of the Baltic Sea. France has tried successfully to equip the aeroplanes with wireless telegraph outfits. But this can mean instruments for short distances only; and in the future, we will probably not be able to count on any far-reaching wireless equipment on account of the weight. The resulting information will therefore be known only after the return of the aeroplane, as is not the case with airships. When we consider the great speed with which the aeroplane travels, such reports will still be very valuable. As a distinct advantage of the aeroplane we must consider the fact that it can approach the enemy within a comparatively slight distance in order to take observations, since the aeroplane offers a very small target, so that it need not fear hostile shells.

As regards spotting of submarines and mines, the same holds true here as with the airship, with the addition that an accurate determination of locality is even more difficult for the aviator in the aeroplane than in the airship.

Use for Reconnoitring in Connection with a Fleet.

On the other hand the work of reconnoitring in the service of the navy is reserved to the aeroplane. An example will illustrate the importance of such a service. An enemy blockading the mouth of the Elbe River wishes to know where the German ships are anchored, in order to move light bodies of troops at night. An aeroplane sent out just before darkness will give good service. Again, the reconnoitring ships of both sides meet in battle. Authoritative information seems out of question, although information as to the strength of the hostile force is essential. Again, an aeroplane will be useful. So far the transmission of orders and reports, the aeroplane can be employed with great usefulness, from shipboard to land and from one ship to another, as, for example, in connection with separate squadrons of a fleet; and finally for communication between land and shipboard.

In this use we have the further question of possibility of flight and landing on board ship. With a good road and start into the wind the aeroplane can rise with an initial start of 30 to 40 metres on an inclined plane, perhaps even faster. At any rate it will be possible to find a deck of sufficient length on large ships, which can be equipped for a satisfactory start. At the end of 1910, an aeroplane rose from the rear promenade deck of the German Hamburg American Line Steamer *Kaiserin Auguste Viktoria* near Sandy Hook and carried dispatches and mail to land. In New York Harbour similar starts from Hamburg-American Line ships were tried with success. It would be more difficult to find room for such

a starting platform on warships where the disposition of the guns is of first consideration. It would be possible, perhaps, to use starting devices similar to those used originally by Wright machines; probably on board with sufficient height for the starting flight a shorter distance will be sufficient than is customary on land, since the aeroplane, as soon as its wheels have left the deck, begins a guiding flight, which the influence of the propellor with increasing horizontal speed will change into the normal soaring flight. [1]

The possibility of such a start from a warship was illustrated by the successful trial of the American aviator Ely, who toward the end of 1910, flew to land from the American protected cruiser *Birmingham*. More difficult than this problem will be alighting on such a limited space as is available on board ship. But this problem also was solved in January, 1911, by Ely although such special arrangements had to be made on the American cruiser *Pennsylvania*, as would be impossible in actual warfare; on the rear deck was an inclined wooden track of 40 metres length and 18 metres wide and a receiving device for the aeroplane. But this could be avoided by having the aeroplane descend on the water and then raise it up on board as one would raise a boat. For this purpose either the frame or the planes must be made to float or special floating runners must be used, which, however, would have the disadvantage of causing a special air resistance. Whatever it may be, aeronautics has already surpassed greater obstacles than these. It is very likely that a competent solution will soon be found. For only with this point in view is it possible for the French to have made steps to introduce aeroplanes in the navy, and they intend to equip land stations and special ships in this way. An old cruiser, *Foudre*, is being rebuilt for this purpose. It is no wonder that they made the start, in view of the advanced standing which they enjoy in the realm of flying. The Americans will probably follow in the near future, for several years ago, the War Department announced a high prize for an aeroplane which can start from shipboard and can alight on the water. A Curtis aeroplane has fulfilled the most essential requirements in January, 1911, in San Francisco, by rising from the water and alighting on the water. This aeroplane had cigar-shaped floating runners. All this shows with what zeal America tries to make the aeroplane useful for naval warfare. Since the German Budget has also means for tests with aeroplanes, it is to be hoped that this will be a further spur for all interested parties, to bridge over the gap which separates Germany in this line from the other two nations.

Other Possible Uses.

As a last point we must view the offensive possibilities of aeroplanes. We should consider that an aeroplane to be used above the sea, should have a great safety factor of operation and great duration of service, so that it may again reach its home destination in safety. Great safety for operation requires great weight, endurance in operation demands a large supply of benzine and gasoline. Moreover, a second person should ride along as observer and for the navigation, compass and travelling instruments will be necessary. There is little space left for conveying any means of attack save with a few light hand grenades, or similar explosive projectiles, which at times may be effective against torpedo boats, submarines or dirigible balloons. But on the whole the aeroplanes will always lack any noticeable offensive power for naval warfare. In addition to this we have the

[1] Since the above was written, Lieut. Samson, R.N., has accomplished a flight from the deck of the " Actaeon " at Sheerness.—Ed.

difficulty of hitting a target when throwing missiles during the rapid flight.

The aeroplanes are and will be useful mostly for reconnoitring.

We do not contend that aeroplanes are at the present time adapted to all the uses mentioned, but that the present state of development gives hopes that these will be reached within a short time. Then it will be time to test them in practice.

Scientific American.

NOTICES OF BOOKS.

Memoirs of General Sir Philip Bainbrigge, K.C.B., and Reminiscences of the Peninsular War.

This slender volume of less than a hundred pages has apparently been printed for private circulation only; it has no title page, bears no printer's or publisher's name, and no date; and the explanatory note at the end added by the unknown editor is anonymous. It contains the autobiography of the late Sir Philip Bainbrigge, narrating the story of his birth and parentage, his childhood and his life as a soldier; the most interesting part of which is his experience as Assistant Quartermaster General to a division of Lord Wellington's army in the Peninsula, and afterwards with the Headquarter Staff. The narrative unfortunately breaks off short just at a most interesting point, the conclusion of the campaign of 1812, after the victory of Salamanca. The author subsequently served throughout the war in Spain and southern France, till its conclusion in 1814; and again at Waterloo. After the peace he continued to serve in the Quartermaster General's Department, commanded the troops in the Belfast district and in Ceylon, and was promoted to the rank of Lieutenant-General in 1855. He compiled these memoirs in the year 1838, and left several copies of them in manuscript. It is a mystery why he never completed them, as he lived for thirty-four years after their compilation, and was unemployed during the last seven years of his long and eventful life. They are written in plain and straightforward language without any attempt at literary ornament, and the author records his feelings and his opinions with soldierly frankness and engaging candour. He was born in 1786; his father had served in the 2nd Queen's and in the 96th Foot, and had gone on half pay when he married. Young Bainbrigge remembered seeing his mother riding on a pillion, and says that the usual question asked on buying a horse in those days was, "will he carry double?" On the breaking out of the Revolutionary War, his father obtained a majority in the Liverpool Volunteers, a Fencible regiment, and marched with it to London. His son attributes his first attraction to a military life to the fine appearance of his father's regiment as it marched to the sound of the drum through the streets of Lichfield; "the finest sight I had ever seen." He writes "they formed four deep, and marched off." This is curious, as up to the middle of the last century, column of route was formed by threes, or "sections of threes." He also records that a troop of the Oxford Blues (Royal Horseguards) was quartered at Lichfield at the same time. But his *début* in arms was made in the navy; all England was ringing with the fame of the victories of Howe and Nelson, and his father procured him a berth as a midshipman as soon as he was thirteen years old. There were no military colleges or entrance examinations in those good old times, and boys

went straight from school into the army and navy. Young Bainbrigge went down by mail-coach from London to Plymouth, and his sea-chest went by wagon; it had not arrived when his ship sailed, and he made his first cruise in his schoolboy suit of clothes. His health broke down under the hard fare and rough work of the navy life in those days, and he was pronounced unfit for the sea service. His father meanwhile had been gazetted to the 20th Foot, and the boy hoped to join the regiment as a volunteer, that being one way of obtaining commissions in those days; but he was still a year too young. The regiment went with the Duke of York's expedition to the Helder, and his father was killed while leading his battalion at the battle of Egmont-op-Zee. The Duke of York thereupon gave young Bainbrigge a commission in his father's regiment.

As he was only fourteen his uncle sent him to a private school at Greenwich which was then the only military school in the United Kingdom, a prototype of the modern crammers. Here, among other things which were not so desirable or beneficial, he learned military sketching and map making, and this accomplishment afterwards stood him in good stead.

He joined the 2nd battalion at Malta, which had just been captured from the French. It is amusing to read what he writes in 1838 concerning Malta and the Mauritius: "That the French will retake these possessions or endeavour to do so, from the English on some future occasion there can be no doubt."

After the Peace of Amiens, our army was reduced with the usual heedless haste, and the disbandment of all second battalions placed their officers on half pay; but the Duke of York was pleased to transfer his protegé to a full pay vacancy in the Royal Fusiliers, where he had the advantage of serving under that good soldier Sir Edward Pakenham, who was colonel of the regiment. Coming from Malta without any plain clothes kit, he found his uniform undesirably conspicuous in the streets of London, where, even in those days of incessant wars the sight of an officer in regimentals was most unusual. And the round hat which was worn in Mediterranean garrisons instead of a cocked hat, excited the derision of Hackney coachmen and street boys. Saluting with the hand was introduced at this time, officers having previously saluted by "pulling off their hats." The escorting of French prisoners of war from one prison to another was a duty that occasionally fell to his lot. He was naturally clever with the pencil, and when stationed at Portsmouth amused himself by making a plan of the fortifications, without anyone being aware of it, which shows, he observes, how easily any foreign spy could have done the same. When this occurred to him he was seized with a panic lest he himself should be suspected of spying, and he put the plans into the fire. His patron, the Duke of York, now gave him a company without purchase in the 18th Royal Irish Regiment of Foot. He was only nineteen years old.

He tried to exchange into the Sutherland Highlanders, as his brother-in-law was in that regiment, but as the 18th were under orders for the West Indies he had to accompany them thither, and was stationed at Curaçao, which had just been captured from the Dutch. While there he made himself useful drawing plans of fortifications. Meanwhile his exchange was sanctioned, but the ship conveying the announcement having been captured by a French privateer, he did not get the news till about a year afterwards. He returned to England to find the whole country

excited over the rising of the Spaniards against Napoleon, and the British expedition to Portugal. His new regiment was at the Cape of Good Hope, and he applied for employment with Sir Arthur Wellesley's army in the Peninsula, and as a proof of his qualifications showed the plans he had made at Curaçao, which led to his admission to the military school at High Wycombe. The subjects for the entrance examination were, the French language, and decimal fractions. He studied mathematics here for the first time in his life. He spent a year and a half at the school and was then posted to the army in Portugal as an Assistant Quartermaster-General, and he joined Lord Wellington's Staff in the lines of Torres Vedras. The record of his Peninsula reminiscences occupies three-fourths of the book. It is a plain unvarnished tale, and he extenuates nothing; he recounts at least two occasions on which our troops behaved badly in face of the enemy, and he freely criticises the conduct of operations. He points out mistakes made by both Wellington and Marmont in their manœuvres preceding the battle of Salamanca, but after accusing the former of making a false move he winds up his argument with the words "This, however, is reasoning after the event, and we do not know what information Lord Wellington had." He often praises the Duke's evenness of temper and calmness of judgment, and his toleration for the mistakes committed by his subordinates.

His talents for sketching and mapping led to his continual employment on such services, and he was constantly sent to sketch the country which might be a possible theatre of operations, at a distance from the army. This was a sore trial to him, as he looked upon it as a disgrace to be absent when there was fighting going on, and he often records the bitter mortification he felt at being thus deprived of the glory and honour of the war. It would really seem as if in those days a man was rather ashamed to be caught by his comrades holding a Staff appointment. In the pursuit of Massena's army he was Assistant Quartermaster-General to Sir Henry Clinton's Division. On one occasion the Division halted for the night where there were three villages; a large one to the left of the road, and two smaller ones on the right. As the 1st Brigade of the Division was the strongest, Captain Bainbrigge quartered it in the big village, and the weaker 2nd and 3rd Brigades in the smaller hamlets. This arrangement aroused the ire of the General, as his right Brigade was placed on the left of the position, and he accused his Quartermaster-General of clubbing his Division.

On another occasion there was only housing accommodation for two Brigades, and Captain Bainbrigge made the Brigade Majors draw lots to decide which Brigade should go into bivouac. This again resulted in "clubbing the Division," and Bainbrigge in vain pleaded that he had acted according to the instructions of the Quartermaster-General for dealing with the like cases; the wrath of General Clinton was not to be appeased but except for these little differences of opinion he was on excellent terms with his Staff officer, whose ability and zeal he thoroughly appreciated. Bainbrigge was transferred with a Brevet Majority to the Headquarter Staff, and was in close attendance on Lord Wellington throughout the whole of the Salamanca campaign, and was constantly employed by him in sketching positions, in reconnoitring the enemy, and in directing and guiding the marches of the columns.

He has given a detailed account of the movements which preceded the battle, but the absence of any map or plan prevents the reader from clearly apprehending them. His account of the battle is merely the record

of his own personal experiences in it. He comments on the superior marching powers of the French as compared with our own men. "The French beat us in marching out and out; they march round us. The first thing to be done to improve the British Army is to train men up in such a manner as to improve their marching; and this is only to be done by lessening the weight they carry; and by constantly practising them in marching, not always sending them from place to place by ship, when it can be done marching."

Honours and rewards were not bestowed with too lavish a hand in those days, and in 1838 Colonel Bainbrigge observes that he is "without a single badge or mark of distinction to shew that I did my duty with satisfaction to my superiors. When, however, I meet officers who went through these campaigns as regimental officers, and who did the hard work, without any badge of distinction, I am satisfied to be without any myself, for I feel that I should be ashamed to wear one when these men are without one."

However, the very next year he was made a C.B., and in 1860 a K.C.B.; he also received a reward for distinguished services, and in 1854 was made Colonel of the Cameronians. He also subsequently received the medal for the Peninsular War with seven clasps (given when most of the men who had earned it were in their graves).—F.H.T. [1]

The Campaigns and History of the Royal Irish Regiment from 1684 to 1902. By Lieutenant-Colonel G. le M. Gretton, late 3rd Battalion Leicestershire Regiment. William Blackwood & Sons, Edinburgh and London, 1911.

"Only in Regimental Histories are the real stories of war and warriors to be found," says "Linesman" in a late number of Blackwood's Magazine; and he proceeds to bestow a well-merited encomium on the present work which, as he justly observes, is "almost a history of British War rather than of a British Regiment." The Royal Irish Regiment, until lately the Eighteenth Foot, is one of the oldest corps in our British Standing Army, having been formed in the year 1684, from independent companies of Foot employed in the reign of Charles II. for the Royal Service in Ireland. Its officers and soldiers seem to have been mainly, if not entirely, Anglo-Irish Protestants, with many old Cromwellians among them; but after the accession of James II., his Viceroy in Ireland, the Earl of Tyrconnel, in pursuance of his Royal Master's unfortunate policy, weeded the regiment of these old soldiers, and on various pretexts mustered out as many Protestants as possible, replacing them by Catholic recruits; he could not, however, dispense with the services of many of the Protestant officers and sergeants, as Celtic Catholics of sufficient ability and experience could not be found to supply their places. The regiment, with other Irish corps, was brought over to England to support the Royal cause, and after the bloodless triumph of the Prince of Orange and the flight of James II., was quartered at Colnbrook, near Hounslow. Here it underwent a reverse re-formation; the five hundred Catholics in its ranks were drafted out, and were marched to Portsmouth, and embarked there for the Isle of Wight to join the ten thousand other Irish soldiers of King James' army, who were there interned in a standing camp till some means could be devised for disposing of them.

[1] The initials appended to the first two book notices (pages 287 and 289) in the February JOURNAL should have been F.H.T., and not as given.—Ed.

As Catholics, they could not be retained in the British Army; and if they had been disbanded, they would have rejoined the service of their old master. King William solved the problem by transferring them *en masse* to his ally, the Emperor of Germany, who, involved at the time in wars with the French on the Rhine, and with the Turks on the Danube, was in sore need of *chair à canon*, and delighted to obtain such a valuable reinforcement. By the way, Colonel Gretton calls this potentate "Emperor of Austria," a title which he did not assume till more than a century later: in the time of the wars of King William III. and Marlborough there was only one Emperor in Europe, and that was the Emperor of Germany. The ranks of the regiment (now numbered as the Eighteenth of the Line by King William according to the date, not of its formation, which would have given it a higher precedence, but of its admission to the English establishment) were filled with Protestants, many of the officers dismissed by Tyrconnel being reinstated.

It is observable that no Irish names are to be found in the lists of its officers at this time, nor for long afterwards: it is not till the close of the eighteenth century that any Celtic names, such as Macdonald and Connolly, appear among the names of officers recorded in this volume. The exclusion of Catholics from our military service barred the native Irish, and strictly limited our recruiting area in Ireland: most of the soldiers in the Royal Irish Regiment in its early campaigns hailed from Ulster. Thus the number of Irish regiments in the British army was small during the first century of its existence; there was a regiment of Horse, and two or three of Dragoons, and only two corps of Foot, the Royal Irish and the Inniskillings. Between the latter, which was numbered the Twenty-seventh of the Line, and the next Irish regiment, the Eighty-sixth or Royal County Down, there is a gap which commemorates the long period during which the profession of the Roman Catholic Doctrine prevented the King's subjects from serving him in a military capacity.

Colonel Gretton does not give us any information as to the date when this disqualification was removed; probably the Celtic men of Highland regiments were our earliest Catholic soldiers. In the great war which followed on the outbreak of the French Revolution, all Roman Catholics, Irish or others, were freely admitted to all ranks. From this time forward the Irish peasantry furnished such a plentiful supply of recruits that most English regiments had a large proportion of Irishmen in the ranks, like the 22nd Foot, now the Cheshire Regiment, whose dauntless courage at Meeanee was greeted by Sir Charles Napier's exclamation of "Magnificent Tipperary!"

The Royal Irish Regiment received its baptism of fire on its native soil, taking part in the battle of the Boyne, and receiving its Royal title as a reward for its conspicuous valour at the storming of the defences of Namur under the eye of a grateful Monarch. That day it also obtained its distinguishing motto, "Virtutis Namurcensis Premium," emblazoned in golden letters on the cover of this large and handsome volume, along with the badge of the Harp and Crown and the honorary emblems gained in many victorious wars, the Lion of Nassau, the Sphinx, and the Chinese Dragon.

On its return voyage from Flanders, the transports in which the regiment was embarked had an encounter with "a Sallee Man-of-War," which the author surmises to have been "probably an Algerian pirate." The Sallee Rovers were indeed Turks like the Algerines, but their cruis-

ing ground was the Atlantic, and not the Mediterranean, and they sailed under the flag of the Sultan of Marocco. Our old friend Robinson Crusoe relates how in one of his early voyages his ship was taken by "a Turkish rover of Sallee," and how he spent some time as a captive at Sallee, "a port belonging to the Moors."

The Royal Regiment of Ireland, as it was then called, served under Marlborough through all his victorious campaigns, and shared in all his triumphs, the names of which it has only quite recently been authorized to emblazon on its colours; for the granting of Battle Honours is a modern practice, and only came into general use early in the Nineteenth Century. One striking episode of these wars was the encounter of the Royal Irish Regiment at the battle of Malplaquet with the Regiment *Royal Irlandais* in the French Army: a succession of volleys were exchanged, and the Franco-Irish Regiment gave way before the fire of the Anglo-Irish platoons, and retired in confusion. A similar incident took place at the battle of Maida, where de Watteville's Swiss Regiment in the British service crossed bayonets with the 1st Swiss Regiment in the French Imperial Army, and with a similar resulting victory to the English side.

Mr. Caton Woodville has given us a spirited picture of an Irish regiment in the French service crossing bayonets with an English regiment at Ramillies; but he has erred in representing the Irish soldiers as wearing white uniforms like the French infantry of the Line; the regiments of the Irish Brigade in the French Army continued to wear the red uniforms of King James II.'s Army up to the time of their disbandment at the outbreak of the French Revolution. A battalion of Dillon's regiment, which was at that time quartered in the French West Indies, passed over into the English Service, for the Irish were staunch loyalists and good Catholics, and could not subscribe to the democratic and atheistic sentiments of the new *régime*. So it came to pass that by the strange irony of fortune the last remnant of the glorious Irish Brigade ended its career under the Union Jack.

The next battle honour on the colours of the Eighteenth is "Egypt," nearly a century later; the flank companies were engaged at Lexington and Bunker's Hill, and the Regiment served once more in Flanders in the War of the Austrian Succession. During the great wars of the Napoleonic era it was employed at the siege of Toulon, where the great Conqueror made his first essay in arms; it successively garrisoned Corsica and Elba, and made descents upon the coasts of Italy. In Abercromby's campaign in Egypt it added the Sphinx to the Lion of Nassau. But soon afterwards it was sent to the West Indies, and another long interval of peace and garrison duty intervened, till it was sent from Ceylon to fight a foeman unworthy of its steel in the Opium War of 1840 with China. Though the Chinese were easy to beat, they were hard to bring to terms, and the Regiment saw many provinces of the Flowery Land during three years of active service, followed by four years in garrison at Hongkong. Thence it proceeded to India, and took part in the Second Burmese War in 1852. It had hardly returned to England after the termination of this war when it was embarked for the Crimea.

Up to this point, the record of a service of nearly two centuries has occupied less than half the book; the remainder is devoted to the events of the last half-century, the Crimean War, the Indian Mutiny, the fighting in the bush of New Zealand, the military promenade in Egypt in 1882, the fruitless expedition to relieve Khartum two years later,

fierce fighting on the Indian North-West frontier, the second Afghan War, and, last but not least, the Boer War, which occupies seventy pages out of the three hundred and seventy in the volume. It is natural that recent events should be described at greater length and with greater wealth of detail than those of more remote times, whatever their importance, owing to the scantiness of the materials available in the case of the latter; and moreover, in 1858 a Second Battalion was raised at Enniskillen, and thus the volume of the Regimental Record is at once doubled. In all foreign armies, a battalion is as much an integral part of the regiment as a company; it is, in fact, simply a tactical unit of the regiment, and has no separate corporate existence; but in the British Army each battalion is an administrative unit, and has a status and a history of its own. The author of a Regimental History like the present, therefore, has to record two separate but parallel stories at the same time; Colonel Gretton has adopted the method of recording them in alternate chapters.

As has been already observed, his work is the history of Britain's wars rather than of a British Regiment. Colonel Gretton's talent as an historian has led him to expatiate at unnecessary length upon passages of history explanatory of events which led to the employment of the Regiment in the field. Thus six pages are devoted to a history of the English occupation of New Zealand to introduce the story of the Maori rising in 1863; and three pages are absorbed by a description of the political state of Egypt during the nineteenth century to explain the causes of the revolution which led to our interference in 1882. Three pages are occupied with an account of the battle of Ramillies, while the share taken in it by the Royal Irish Regiment is discussed in a single paragraph at the close. As a Regimental History the book would have been better suited to its title had it been compressed into a quarter of its present size by leaving out digressions on subjects which affect the Regiment only in so far as they affect the whole British Empire. But for these digressions, the author would not have had to complain that "unfortunately want of space renders it impossible to describe in detail the many engagements and operations of importance in which they took part," "they" referring to the Mounted Infantry of the Royal Irish in South Africa. By the way, in describing Marlborough's victory at Schellenberg, Colonel Gretton calls the Scots Greys "cavalry men," and speaks of their being ordered to dismount and storm the works as something abnormal; but Dragoons in those days were mounted Infantry, were armed with musket and bayonet, and were accustomed to fight on foot as well as on horseback.

Colonel Gretton distinguishes the Regiment throughout his chronicle by the Roman figures XVIII., while he uses the ordinary Arabic numerals to denote all other corps. The use of the Roman numerals was at one time universal in regimental titles, and of late years there has been a tendency to revert to it, though officially the foot regiments of the British Army have no numerical title at all. In spite of our Army Reformers, however, Colonel Gretton persists in ignoring this regrettable deprivation and continues to call the Royal Irish the XVIIIth to the end of the chapter. His statement that "the second battalion of the Royal Irish Regiment was winning its spurs in New Zealand" seems a curious metaphor in the case of an infantry corps.

Of the internal affairs and interior economy of the Regiment this History tells us but little; but some of its passages throw interesting sidelights upon matters of military organization and equipment. Thus we find

from an indent on the Master-General of the Ordnance, dated 1689, that 250 men of the regiment were still armed with pikes, the remaining 600 having firelocks and bayonets and "bandelers," presumably sets of bandoliers. The 39 halberts included in the indent were no doubt for the sergeants: and there is an item of 1,000 flints for the firelocks. It is an interesting instance of a period of transition in military equipment, to find flintlock muskets and bayonets, bandoliers, and pikes all simultaneously in use in one corps. There are fourteen appendices to this volume including List of Stations, Casualty Rolls, names and biographical sketches of all the Colonels, General and Regimental Orders, Honours and Rewards, &c. There are some errors in the lists of names, perhaps owing to the fact that the History has been compiled by an officer belonging to another corps; *e.g.*, in the roll of casualties at Abu Klea given at page 396, the name of the only soldier of the Royal Irish killed on that occasion is omitted: this was Private Phillips of the H Company, who was shot through the head. At page 230 the name of Captain E. Tufnell is included among those of the officers who served in the Afghan War, but this officer was invalided home from Peshawar before the regiment took the field. There are probably other similar errors in the list which have escaped notice. There is an index of proper names and place-names, and the book is illustrated with a facsimile reproduction of a letter of Lord Wolseley, its Colonel-in-Chief, also with full-page photographs of the War Memorials to its fallen heroes in the Cathedral of St. Patrick in Dublin, and at Clonmel. F.H.T.

FOREIGN PERIODICALS.

NAVAL.

AUSTRIA-HUNGARY.

MITTEILUNGEN AUS DEM GEBIETE DES SEEWESENS. Pola: **No. III., 1912.**—The Körting submarine motor. Efforts to attain a uniform system of maritime law up to the Conference of Paris. The annual Report on the United States Navy. Naval construction. Creation of a Naval War Staff in England.

FRANCE.

REVUE MARITIME. Paris: **January, 1912.**—The theoretical basis of the science of aviation. Analysis of the German naval Budget. Comparative study of the French and German naval Budgets.

LA MARINE FRANCAISE. Paris: **January, 1912.**—Our naval power and Admiral Mahan's book. What form will the naval manœuvres of 1912 take. The composition of the Navy.

LA VIE MARITIME. Paris: **10th February, 1912.**—The rank of "Capitaine de Corvette." The new American Super-Dreadnoughts. German naval shipbuilding yards. **25th December.**—The naval programme. Internal combustion engines. Notes on boilers. The naval programme and the naval Budget.

LE YACHT. Paris: **3rd February, 1912.**—Naval Schools in France and abroad. **10th February.**—Battleships of 1912. The U. S. destroyer "Warrington." The port of Batoum. The destroyer "Janissaire." **17th February.**—Accidents in foreign navies in 1911. **24th February.—The** adoption of the naval programme by the Chamber. The Dreadnought "Espana."

LE MONITEUR DE LA FLOTTE. Paris: **3rd February, 1912.**—The cordiality of the Entente. The reorganization of the naval personnel. Promotion on board ship. **10th February.**—Torpedo nets. The naval programme in Parliament. **17th February.**—The Navy in Parliament. **24th February.**—The reorganization of the naval personnel. The Navy in Parliament.

GERMANY.

MARINE RUNDSCHAU. Berlin: **March, 1912.**—The defence of La Gironde, 1814. The decline of Dutch sea power. The creation of a Naval War Staff for the British Navy. The origin of the geographical atlas. The abolition of the Naval Hospital at Yokohama. The Chinese Republic. The Hydrographic Section of the Nautical Department, 1861 to 1911. The 13th meeting of the Society of Naval Architects. The Turco-Italian War.

ITALY.

RIVISTA MARITTIMA. Rome: **January, 1912.**—The employment of alternating currents in electrical installations on board ship. The applicability of various systems of current generation to different types of engines and machines in ships. Automatic device to ensure the longitudinal stability of submarines; suggested employment of gyroscopic action. Contract and premium work compared. Safety in aviation.

MILITARY.

AUSTRIA-HUNGARY.

STREFFLEURS MILITÄRISCHE ZEITSCHRIFT. Vienna: **February, 1912.**—The march of General Davout's corps from the Isar to Vienna. Moltke's tenure of the office of Chief of the General Staff in peace time. Italy and Tripoli. † The Russian Regulations for the conduct of the infantry battle. § Progress in foreign armies (France, Italy). The Russo-Persian conflict. The motor gun. Communications from the School of Musketry. Foreign notes: France, Russia. Naval notes. Technical notes.

FRANCE.

REVUE MILITAIRE DES ARMÉES ETRANGÈRES. Paris: **February, 1912.**—The reorganization of the Rumanian Army. The British "Infantry Training" of May, 1911. The German Imperial Manœuvres of 1911.

REVUE D'HISTOIRE. Paris: **February, 1912.**—The campaign of 1794 in Holland. † The Army of the East under Kleber. † Napoleon's methods of command during the wars in Spain. † The campaign of 1813. † The

*—to be continued. †—continued. §—concluded.

actions at Laon and Athies. § The war of 1870-1871 (The first Army of the Loire).

JOURNAL DES SCIENCES MILITAIRES. Paris: **1st February, 1912.**—The intervention of England in a Continental war. The French Infantry Training Manual. † The lessons of the German Imperial Manœuvres. † The apparent contradictions in the Regulations. The campaign on the upper Guir in April-May, 1908. † Instructional squads in the artillery. **15th February, 1912.**—The freedom of action of the higher commanders. The French Infantry Training Manual. † The lesson of the German Imperial Manœuvres. † Instructional squads in the artillery. Reserve regiments of infantry and the promotion of subalterns. Competitive examination for the entrance to the French War School. A study of the manœuvre of Bautzen, 1813.

LE SPECTATEUR MILITAIRE. Paris: **1st February, 1912.**—Night manœuvres.† The German Imperial Manœuvres of 1911.† The Spanish operations on the Kert.† Use of aircraft in connection with coast and naval artillery practice. **15th February.**—Swearing allegiance to the colours in Germany. The German Imperial Manœuvres of 1911. § The Spanish operations on the Kert. §

REVUE MILITAIRE GÈNERALE. Paris: **January, 1912.**—The rôle of the covering troops, * by Captain Culmann. Artillery in the battle, according to the regulations of September, 1910. A sixth study of Alpine tactics. The naval battle. § Tendencies of the artillery. Napoleon in the field. † Studies of the Russo-Japanese War.

GERMANY.

INTERNATIONALE REVUE. Cologne: **February, 1912.**—*Germany*: recruiting; new machine-gun regulations. *France*: The Colonial Army; artillery ammunition supply; aviation. **French Supplement 155.** The 7.5 cm. Dutch Colonial gun. The development of the submarine; the duties of commanders in an infantry attack; Chilian field guns; bomb throwing from aeroplanes. **German Supplement 137.** The reorganization of the Swiss Army.

MILITÄR WOCHENBLATT. Berlin: **No. 17, 1st February, 1912.**—A new sub-target apparatus; the French operations in Marocco; † the Belgian Army. **No. 18.**—Cæsar's strategy; * modern war; the Italo-Turkish war. † **No. 19.**—The Turkish Army; Cæsar's strategy; † modern war. § **No. 20.**—Moltke's military works (The Battle). Throwing cavalry patrols over rivers (concluded in No. 21). Russian technical troops and engineer officers (concluded in No. 21). Reorganization of the Swiss Army. Training of naval and military Ersatz in 1910. **No. 21.**—Notes from the French Army; volunteer militia in Ceuta. **No. 22.**—The battle of Sandepu; notes from the French Army; German aviation. **No. 23.**—Plans of campaign 100 years ago (concluded in No. 24); the strength of positions; casualties of cavalry on the march in 1870-1871; posts and telegraphs in German S.W. Africa. **No. 24.**—The Italo-Turkish War; fire discipline and fire direction. **No. 25.**—The decay of warlike spirit; the rate of marching of field artillery; field glasses used by French officers. **No. 26.**—

*—to be continued. †—continued. §—concluded.

The rate of marching of field artillery; the Freiburg boy scouts. **No. 27.**—Containing actions and envelopments; leadership in recent wars; cyclist companies. **No. 28.**—The new signalling regulations; machine gun tactics; **No. 29 of 29th February.**—Wood fighting for infantry; the new Dutch Militia Bill.

ITALY.

RIVISTA MILITAIRE ITALIANA. Rome: **16th February, 1912.**—A study of material, moral, and tactical factors in battle. * Initiative, freedom of action and intervention. § Infantry tactics in close country. * (The topographical features of the great basin of the Po valley are considered, and their respective influences on infantry tactics discussed). Cyrenaica § (Climate and communications). The Estensi militia. A funeral oration at the grave of an Italian officer at Tripoli. Italy of to-day, and her soldiers. Machine-guns on the battlefield. * (Characteristics of machine-guns; comparison with collective rifle fire). Accuracy and efficiency of fire. (Moral effect; employment in general, in attack and in defence; gun shields). Mahomet, the Koran, and Islam. * The Press and the war.

---

*—to be continued. †—continued. §—concluded.

AKTIENGESELLSCHAFT HAHN

CASSEL, GERMANY.

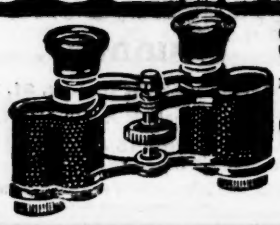
Speciality:—Instruments of every description for TESTING ARMS AND EXPLOSIVES. Optical Instruments for Artillery. "Hahn" Telemeters for use in the Army and Navy.

Agents:—PLUTTE, SCHEELE & CO., LTD., 18/19, Queenhithe, London, E.C.

GOERZ

Increased Field. Enhanced Stereoscopic Effect. Great Illumination. Perfect Definition.

Made by Inventors of Dial Sight 7, now being introduced into the Service.



SPECIAL ARMY MODEL.

DUST AND MOISTURE PROOF.

Can be fitted with GRATICULES RAIN GUARDS, SCREENS, &c.

Of all Opticians. Service Booklet 50 from

C. P. GOERZ, Optical Works, &c. 1-6 Holborn Circus, London, E.C.

BINOCULARS

WIMBLEDON.

Artistic and Beautifully Furnished House TO LET, standing in its own ground, near Common and two Golf Links, elaborately decorated, and with lovely garden, Southern aspect.

House comprises Drawing Room, Library, furnished in Oak, Dining Room, furnished in black Oak, and with old Oak rafter ceiling, Morning Room, Lounge Hall, two Double and one Single Bedroom on the first floor, one double and one single Bedroom on the second floor, Kitchen, Scullery, Butler's Pantry, and usual offices, Bath (h. & c.), two lavatories, both h. & c., three W.C's.

Electric Light throughout, gas-cooker in scullery, Telephone (No. 466 P.O. Wimbledon) two Ozonairs—can be removed from room to room—Handsome Rosewood full-sized Concert Grand Piano, by Broadwood—almost a new Instrument—Inter Phones to all parts of the house, &c.

Gardens comprise full size Tennis Court, Herbaceous Borders, handsomely laid out Rose Garden on the Italian principle, small front Lawn, nice sized Kitchen Garden with fruit trees. This Garden is considered one of the prettiest in the neighbourhood, and contains upwards of 200 rose trees, many of them having won gold medals, cups, and prizes by the Growers. Tool house, with excellent supply of first-class Garden tools.

The whole place, both House and Grounds, well kept and in perfect repair. Private road.

For a long let £7 7s. per week would be accepted; for any shorter period than 12 months, **£8 8s.** per week; under **no** circumstances would a let be entertained for a shorter period than from 5-6 months. Servants could be left and Gardener duly arranged with; two good Kennels for Dogs, in trellis work enclosure.

Apply for order to view, by letter **only,** "FREEHOLDER," care of the Secretary, The Gilbert-Wood Press, Norfolk House, Victoria Embankment, London, W.C. (*corner of Norfolk Street, facing the Temple Station.*)

ESTABLISHED 1820.

Contractors to British Admiralty, War Office, India Office, etc., etc.

C. E. HEINKE & Co.

SUBMARINE ENGINEERS AND INDIA-RUBBER MANUFACTURERS

87, Grange Road, Bermondsey, London, S.E.

Telephone Hop 1998. Code: A.B.C.

Telegrams: "Heindig, London."

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT WOOD'S OFFICES, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.

TELEPHONE No. 4680 GERRARD.

HISTORY

OF THE

7TH

(QUEEN'S OWN)

HUSSARS

For the purposes of this work, which is now being compiled by the direction of Lieut.-Colonel R. M. POORE, D.S.O., and the Officers of the 7th Hussars, INFORMATION is desired as to the existence of:—

1. **Letters, Papers, Diaries, &c., of those who have served in the Regiment.**
2. **Portraits of Distinguished Officers.**
3. **Historical Relics, Arms, Accoutrements, War Trophies, especially Guidons and Old Prints.**

Such information would be most gratefully received by the Author, Mr. C. R. B. BARRETT, c/o Lieut.-Colonel A. LEETHAM, Royal United Service Institution, Whitehall, S.W.

LA DÉFENSE NATIONALE

REVUE MILITAIRE OTTOMANE
SCIENTIFIQUE ET TECHNIQUE

1st & 15th OF EVERY MONTH

This important Official Publication is published in THREE Languages, which appear in the following order in each fortnightly issue of same:—

French, German & Turkish;

there is an excellent article in each number, by a very well known British Officer.

Price 1/- net. Subscription Rate 21/- per annum. (Postage extra.)

Sole London Director and Publisher:—

C. GILBERT-WOOD —Norfolk House, Victoria Embankment, W.C.

"The most complete work that as appeared in any language."

Kriegstechnische Zeitschrift, No. 6 of 1911.

Modern Guns & Gunnery.

With Addenda to Jan. 31, 1912

By Colonel H. A BETHELL.

Price **15/-** net.

Postage 6d. extra (or abroad 1/3 extra)

Published at Woolwich by **F. J. CATTERMOLE**

Order through any Bookseller.

THE CAVALRY JOURNAL

Published by Authority of the Army Council, and under the direction of General Sir J. D. P. FRENCH, G.C.V.O., K.C.B., K.C.M.G., Colonel 19th Hussars, Inspector-General of the Forces, assisted by Lieut.-General Sir R. S. S. BADEN-POWELL, K.C.B., K.C.V.O.

Published Quarterly, Price 2/6 net. Postage 4d.

NOW READY. No. 25.—JANUARY, 1912. NOW READY.

CONTENTS.

THE FATHER OF THE SQUADRON LEADERS. (Illustrated).
THE TRAINING OF A REMOUNT. By Lieutenant S. J. HARDY, Royal Scots Greys.
CAVALRY JOURNAL COMMITTEE. Report of Meeting.
WORTHY OF THEIR STEEL. By Colonel E. A. HERBERT, M.V.O., late 6th Inniskilling Dragoons.
THE HOME OF THE CAVALRY JOURNAL. By the Managing Editor. (Illustrated).
TROOPER THOMAS BROWN, 3rd DRAGOONS, OF DETTINGEN FAME. By CHARLES DALTON, F.R.G.S. (Illustrated).
MACHINE GUNS WITH CAVALRY. By Lieutenant P. BOERESEN, 5th Roumanian Hussars.
THE GERMAN CAVALRY MANŒUVRES OF 1911. By CECIL BATTINE.
THE NEW ITALIAN CAVALRY TRAINING. By Colonel H. C. WYLLY, C.B.
BRIGADIER-GENERAL JOHN JACOB, C.B. By Captain H. GARRETT, R.N. (Illustrated).
THE USE OF THE SWORD AND LANCE MOUNTED. By Sergeant L. HATTON, 20th Hussars.
GREAT CAVALRY LEADERS: "LASALLE." By Brig.-General H. De B. De LISLE, C.B., D.S.O. (Illustrated).
CAVALRY REGIMENTAL MEDALS. By D. HASTINGS IRWIN. (Illustrated).
CAVALRY COLLISIONS IN WAR. By Lieutenant T. LISHMAN, A.V.C.
WHY NOT A SWORD-BAYONET FOR THE YEOMANRY. By Major H. G. WATKIN, 4th Hussars.
SAUGOR CAVALRY SCHOOL.
YEOMANRY CRITICISM.
RECENT PUBLICATIONS
EDITORIAL NOTES.
FOREIGN NOTES.
SPORTING NOTES.
THE LATE GENERAL SIR BAKER CREED RUSSELL, G.C.B., etc. (Illustrated).
THE LATE MAJOR-GENERAL SIR STANLEY CLARKE, G.C.V.O., etc.

SUBSCRIPTIONS should be sent direct to:—The Managing Editor at

THE ROYAL UNITED SERVICE INSTITUTION, WHITEHALL, LONDON, S.W.

or Copies may be obtained by ALL Booksellers, Newsagents and Railway Booksellers, from

C. GILBERT-WOOD, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C.

Telephone Nos. 4580 & 4580A GERRARD. Telegraphic Address:—"GILBERWOOD, LONDON."

CAMPAIGNS ON THE NORTH-WEST FRONTIER.

By Captain H. L. NEVILL, R.F.A., D.S.O.

With an Introduction by Field-Marshal THE EARL ROBERTS, V.C., K.G.
With Maps and Illustrations. **15s.** net.

This is the first attempt to write a continuous and co-ordinate account of the various campaigns, small and great, which have proved necessary to the protection and maintenance of the Indian frontier. The record is not only of great value to military and political students, but is full of incident and interest likely to attract the general reader.

JOHN MURRAY - - - ALBEMARLE STREET, W.

Ready Shortly. *THE "GILBERWOOD" SERIES.* **Price 3d. Nett.**

"THE PROFESSION OF ARMS."

This unique little work is based—as the Author himself states—on the fact of the growing unpopularity of the Army, which is one of the signs of the times, for as we all know a few years ago Commissions were keenly competed for, and yet at the present moment there appears to be considerable difficulty in obtaining enough Candidates to fill the vacancies. This Booklet is an attempt to show that the soldier's calling is far from what it may seem to be to the uninitiated.

LONDON:—C. GILBERT-WOOD, Norfolk House, W.C.

HINTS TO YOUNG OFFICERS ON JOINING THE INDIAN SERVICES'

NOW Ready

By Major Alban Wilson (8th Goorkhas)

This small and handy Booklet is indispensable to any young fellow proceeding to India in Army, Police, or Civil Administration of the Government.

Mr. F. G. IVEY writes:—"I sincerely congratulate you on the most delightful 'manner hints' I have yet read. I do hope this pamphlet will be widely disseminated amongst those to whom it is most essential that they should be posted up in the Etiquette of India, and thus make our service a model for all nations. I wish your ideas could be instilled into the minds of *all* the young people of the present day."

"THE BROAD ARROW" says: "The hints enumerated in this pamphlet are of the utmost service to the young officer and repay very careful perusal . . . . It is an invaluable guide."

"THE DAILY EXPRESS" says:—"A useful list of 'Don'ts' . . . ought to be studied by every one who wishes to avoid 'putting his foot in it' in the land where manners count for much."

"THE PEOPLE" says: "A praiseworthy collection of pearls." . . . "Contains such excellent advice."

"NOTTINGHAM GUARDIAN" says:—"Capital little series of maxims, prepared with wit and good sense. Bad manners are a serious injury to Imperial Prestige in dealing with the natives of India, and we trust the distilled wisdom of these pages will be laid to heart by every subaltern in every mess."

PRICE **3d.** NET. *Postage 1d. extra.* London—**C. GILBERT-WOOD** Norfolk House, Victoria Embankment, W.C.

ENGLAND'S PERIL, By "FIDELIS." Now Ready.

Mr. HAROLD F. WYATT (the Joint Founder and Hon. Sec. of the Imperial Maritime League), writes:—"Thanks for your able Pamphlet which I am very glad to have, and upon which I congratulate you. Such work as this is sorely needed at the present time."

THE PEOPLE says:—"Everybody should read 'England's Peril'—a stirring and convincing argument."

"BELFAST NEWS LETTER" says:—The Author, who advocates compulsory Military Service, is a well known officer, who has done a good deal of writing on Service Subjects.

Price **6d.** Net. *Postage 1d. extra.* London: **C. GILBERT-WOOD,** Norfolk House, Victoria Embankment, W.C.

'OMNE TEMPUS' RUBBERLESS RAINPROOFS.

(Military, Civilian, or Ladies', Boys' or Girls.')

BEAR AN UNQUALIFIED GUARANTEE.

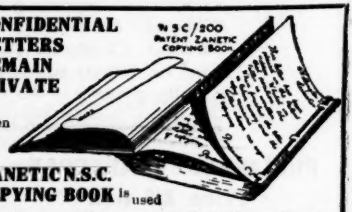
"If your Omne Tempus fails to keep out the rain, we will take it back." **45/-**

Ready for wear, in all sizes and styles, or made to order. Healthy, cool and comfortable, and moreover of the texture of an ordinary close-woven woollen tweed, not a cold, clammy linen-like fabric.

Established 80 Years.

SAMUEL BROTHERS, Ltd.,
65 & 67, Ludgate Hill, LONDON, E.C.

CONFIDENTIAL LETTERS REMAIN PRIVATE



when the

ZANETIC N.S.C. COPYING BOOK is used

You slip your letter paper into the holder, write your letter, and the copy is made as you write. "Letter shows no sign of copying." The letter is posted and the book locked up. 400 Octavo (8in. x 5in.) letters, or 700 Quarto, can be copied in N.S.C./100. Post Free for 3/3. Or 800 Octavo or 400 Quarto in N.S.C./200. Post Free for 4/6. Sample of the celebrated Zanetic Paper which produces this result free, if stamped envelope sent to—

J.R.U.S. Zanetic, Zanetic Wks, Welford Rd, Leicester

FOR THE SERVICES

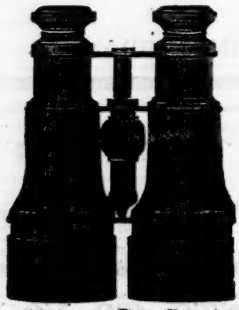
DEPENDABLE OUTDOOR ACCESSORIES AT

GAMAGES

THE MARKET PLACE OF THE WORLD.

The "Gamage" Night Marching Compass. Snap Hunter Case. Military Pattern. Illuminous Glass Dial and Bar Needle with sights divided every 5° and figures every 20° to 360°. Check and fixed stop action. Finest compass at the price ever put on the market.

Price **21/6** complete in case with sling for shoulder.



The "Holborn" Field Glass. Gives remarkable definition. Made for hard wear. Covered Black Morocco. Sun Shade, and in case with Neck Sling complete.

Price **22/6.**

A.W. GAMAGE Ltd. HOLBORN. & BENETFINK & Co.Ltd CHEAPSIDE.

"NATIONAL DEFENCE"

The Official Organ of the Council of County Territorial Associations; and of the National Defence Association. *(Published under the Authority of the Council.)*

A Magazine that appeals to all interested in the National Defence Question. It contains Articles by well-known Authors on both Naval and Military matters and should be read by all who have :: the protection of this Country and its Colonies at heart. ::

PUBLISHED QUARTERLY.

Price 2/6 net.

Annual Subscription **10/-**; or with postage to any part of the World, **11/4.**

Published for the National Defence Association by

HUGH REES, Ltd.,

5, Regent Street, London, S.W.

All Applications for Advertisement Space in this Magazine should be made to :—

The Manager, National Defence, 15, Pall Mall East, London, S.W.

Telephone: 9427 City.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT WOOD & OFFICES, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.
TELEPHONE No. 4680 GERRARD.

INSTAL IN YOUR HOME A SYSTEM OF TELEPHONES

THE COST IS QUITE MODERATE

ASK FOR

Western-Electric

INTERPHONES

With them you Avoid Much Running Up and Down Stairs and from Room to Room. You Can Bring Everybody in the House Within Talking Distance by Pushing a Button on the Nearest Interphone.

WRITE REFERENCE "Y" FOR PARTICULARS.

Western Electric Co., Ltd. Norfolk House, Victoria Embankment, W.C.

WORKS—NORTH WOOLWICH, LONDON.

Union-Castle Line

ROYAL MAIL SERVICE

TO SOUTH AND EAST AFRICA.

WEEKLY SAILINGS.

London and Southampton to Cape Colony, Natal, Delagoa Bay, Beira, East Africa, and Mauritius.

Calling at Madeira, Las Palmas, Teneriffe, Ascension, St. Helena, and Lobito Bay.

Monthly Direct East African Service, *via* Gibraltar, —— Marseilles, Naples, and the Suez Canal. ——

Pleasure Cruises to the Continent (Hamburg and Antwerp) and the Mediterranean. Reduced Fares for Tourists during Spring and Summer to Madeira, Las Palmas, and Teneriffe.

TOURS ROUND AFRICA BY UNION CASTLE STEAMERS.

For all Information apply to—

DONALD CURRIE & CO., *Managers,*

— LONDON AND SOUTHAMPTON. —

Branch Offices of the Company at—

BIRMINGHAM, LEEDS, LIVERPOOL, MANCHESTER, & GLASGOW.

FOLKESTONE.

HIGH-CLASS PREPARATORY SCHOOL FOR BOYS.

The Course of Instruction comprises:

Religious Knowledge, Thorough English, French and German, Arithmetic, Algebra, Geometry (Practical and Theoretical), Greek and Latin, as taught in the Public Schools. The School is provided with an excellent Playground, Football and Cricket Fields. Drilling and Gymnastics by Instructors from Military Gymnasium at Shorncliffe Camp. Swimming in Sea-water Swimming Baths. Moderate and inclusive terms. No Day Pupils received.

MISS BRADNACK, Leas Court, Folkestone.

Assisted by University Graduates.

Highest References from extensive Army connection.

— THE —

Great Central Rly. is "The Comfortable Line."

EXPRESS RESTAURANT CAR TRAINS

LONDON (Marylebone) and

RUGBY,	**SHEFFIELD,**	**HUDDERSFIELD,**
LEICESTER,	**YORK,**	**HALIFAX,**
NOTTINGHAM,	**LEEDS,**	**BRADFORD,**

MANCHESTER, &c.

Cross Country Expresses are a distinct Feature of the G.C. Service.

NEWCASTLE, SUNDERLAND, DURHAM, YORK, MANCHESTER, BRADFORD, HUDDERSFIELD, ROTHERHAM & SHEFFIELD *are provided with Through Luncheon Car Trains via* NOTTINGHAM, LEICESTER & BANBURY.

to and from OXFORD, SOUTHAMPTON, BOURNEMOUTH & the SOUTH WESTERN LINE, also to and from GLOUCESTER, CHELTENHAM, NEWPORT, CARDIFF, BARRY and SOUTH WALES.

BATH and BRISTOL (with direct connections for the WEST OF ENGLAND *are reached by through Breakfast and Luncheon Car Trains from* LEEDS, WAKEFIELD, HALIFAX, HUDDERSFIELD, SHEFFIELD, NOTTINGHAM and LEICESTER.

Via MARYLEBONE is LONDON'S POPULAR ROUTE for STRATFORD-on-AVON.

THE CONTINENT is reached by Express Boat Trains to GRIMSBY, and regular sailings to HAMBURG, ROTTERDAM and ANTWERP.

EXPRESS TRAINS are equipped with RESTAURANT CARS.

For particulars of Train Service, Special Travel facilities and other information apply at any Great Central Station or Agency, Dean and Dawson's Offices, or send a Postcard to Publicity Department, 216, Marylebone Road, London, N.W.

SAM FAY, *General Manager.*

WEEDS DISFIGURE YOUR LAWNS AND WALKS.

"CLIMAX" LAWN SAND

Kills weeds on lawns, fertilizes the finer grasses; it has transformed thousands of weedy lawns. Large sample and full particulars, **1/-** post free. 28 lbs., to dress 100 sq. yds., **6/-**, 56 lbs., **11/-**, 1 cwt., **20/-**, carriage paid.

"CLIMAX" WEED KILLER

Kills all weeds on walks and keeps them bright and clean. No. 1 tin, **1/-**, No. 2, **2/-**, No. 3, **3/6**, No. 4, **6/-**, carriage paid.

"Reliable Garden Helps," 1d. *post free.*

BOUNDARY CHEMICAL CO., Ltd., Cranmer St. Liverpool.

C. GILBERT-WOOD, F.R.G.S. GOVERNING DIRECTOR. MEMBER OF THE COUNCIL OF THE IMPERIAL MARITIME LEAGUE ETC.

THE GILBERT-WOOD PRESS

REGISTERED TELEGRAPHIC ADDRESS "GILBER-WOOD" LONDON"

TELEGRAPHIC CODES {A.B.C. VIA EASTERN.

TELEPHONES: 4680 GERRARD, 4680 A GERRARD

Mr. C. Gilbert-Wood's List

NOW READY.

"Canoeing and Camping Adventures,"
By R. C. Anderson, F.R.G.S. ... **3s. 6d.** net.
"Command of the Sea: What is it?"
By Major Churchill, R.A. ... **1s.** net.
"Defenders of our Empire" (Part I.)
By C. Gilbert-Wood, F.R.G.S. ... **1s.** net.
"England's Peril,"
By "Fidelis" ... ... **6d.** net.
"Hints to Young Officers on Joining the Indian Services,"
By Major J. Alban-Wilson ... **3d.** net.
"Naval Wars in the Baltic,"
By R. C. Anderson, M.A., F.R.G.S. **15s.** net.
"Olympic and Titanic Souvenir Number" of "The Shipbuilder." **2s.** net.

READY SHORTLY.

Annual International Number—1912—of "The Shipbuilder." **2s.** net.
"The Profession of Arms." ... **3d.** net.

IN PREPARATION.

"Defenders of our Empire" (Part II.) **1s.** net.

PERIODICAL PUBLICATIONS.

"The Cavalry Journal."
"La Defense Nationale."
"Fighting Ships."
"The Indian Volunteer Record and Military News of India."
"The Journal of the Royal Artillery."
"The Journal of the Royal United Service Institution."
"The Journal of the United Service Institution of India."
"The Journal of the United Service Institution of New South Wales."
"The Royal Navy List."
"The Shipbuilder," etc., etc.

NAVAL & MILITARY PUBLISHERS

& NEWSPAPER PROPRIETORS.

NAVAL AND MILITARY LITERARY AGENTS AND ADVERTISING EXPERTS.

PUBLISHING AND (OR) ADVERTISING DEPARTMENTS OF THESE

OFFICIAL AND (OR) SEMI-OFFICIAL PUBLICATIONS ETC. ETC.

ESTABLISHED JANUARY 1894

PUBLISHING & ADVERTISING DEPARTMENTS:
NORFOLK HOUSE,
VICTORIA EMBANKMENT,
LONDON. W.C.

Mr. C. GILBERT-WOOD is always prepared to give expert advice on the Publication of **NAVAL AND MILITARY BOOKS,** and also to undertake the Printing, Binding, and Publishing of same.

Connoisseurs of **COFFEE**

DRINK THE

RED WHITE & BLUE.

DELICIOUS FOR BREAKFAST & AFTER DINNER.

In making, use LESS QUANTITY, it being much stronger than ordinary COFFEE

A PROMISING EMIGRANT

23,622

Young Lives rescued
from misery and destitution
and placed out
on Canadian Farms by

Dr.

Barnardo's Homes

98 PER CENT. ARE SUCCESSFUL.

Will you help to give the chance of a lifetime to one of the Boys or Girls sailing with the

SPRING PARTY OF YOUNG EMIGRANTS

£10 per head defrays cost; but Gifts of any amount will be gratefully received.

*** *Cheques and P.O.'s payable "Dr. Barnardo's Homes" may be sent to the Honorary Director, WILLIAM BAKER, Esq., M.A., LL.B., at Head Offices, 18 to 26, Stepney Causeway, London, E.*

CLAUDE WRIGHT, General Secretary.

B.U.S.I.J.

GAUTIER'S BRANDIES.

GAUTIER FRÈRES. COGNAC. Estd. 1755.

THE ADVERTISEMENT DEPARTMENT OF THIS JOURNAL IS CONDUCTED IN GILBERT WOOD'S OFFICES, NORFOLK HOUSE, VICTORIA EMBANKMENT, LONDON, W.C., WHERE ALL COMMUNICATIONS SHOULD BE ADDRESSED.
TELEPHONE NO. 4680 GERRARD.